JANUARY, 1939

ELECTRICAL SOUTH

UNIVERSITY OF FLORIDA
LIBRARY

AMONG the most attractive and popular hotels catering to the tourists and commercial travelers is the Annapolis in Washington.

Here under the direction of the Manger management, improvements are constantly being made to further perfect the service.

HUNTER advanced style wall type oscillators have been adopted for this house as standard equipment.

HUNTER FAN & VENTILATING COMPANY, INC.

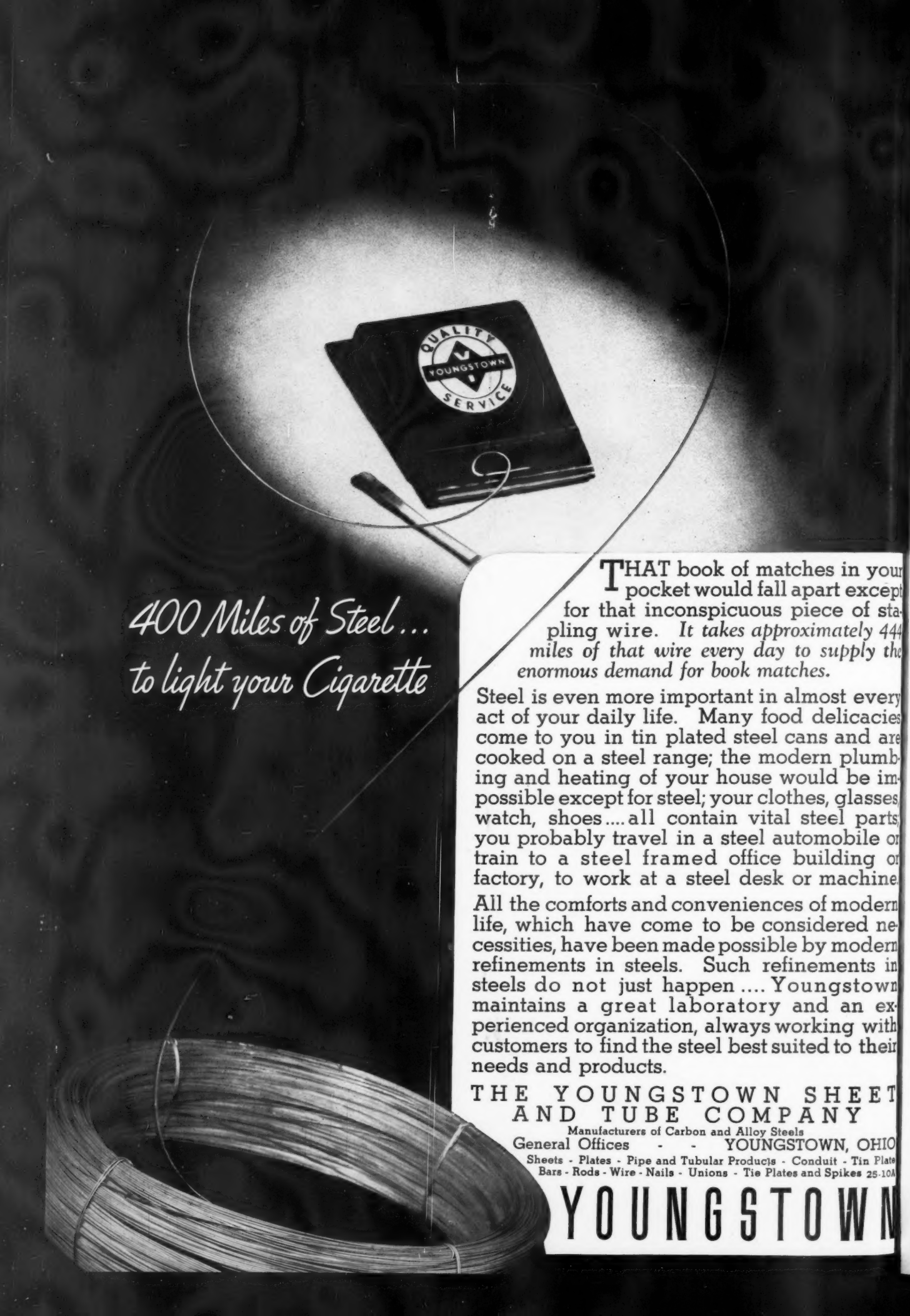
Factory: FULTON, N. Y.

General Sales Offices: Memphis, Sterick Bldg. *Eastern Sales Offices:* New York, 92 Warren Street

Sales Offices:

DALLAS PHILADELPHIA BOSTON DETROIT CLEVELAND ATLANTA
CHICAGO ST. LOUIS NEW ORLEANS PITTSBURGH WASHINGTON

621.30
E385



400 Miles of Steel... to light your Cigarette

THAT book of matches in your pocket would fall apart except for that inconspicuous piece of stapling wire. *It takes approximately 444 miles of that wire every day to supply the enormous demand for book matches.*

Steel is even more important in almost every act of your daily life. Many food delicacies come to you in tin plated steel cans and are cooked on a steel range; the modern plumbing and heating of your house would be impossible except for steel; your clothes, glasses, watch, shoes.... all contain vital steel parts; you probably travel in a steel automobile or train to a steel framed office building or factory, to work at a steel desk or machine.

All the comforts and conveniences of modern life, which have come to be considered necessities, have been made possible by modern refinements in steels. Such refinements in steels do not just happen .... Youngstown maintains a great laboratory and an experienced organization, always working with customers to find the steel best suited to their needs and products.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

General Offices - - YOUNGSTOWN, OHIO

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Bars - Rods - Wire - Nails - Unions - Tie Plates and Spikes 25-10A

YOUNGSTOWN

HAZARD

OFFERS COMPLETE LINE for ADEQUATE WIRING

Adequate wiring must begin with an adequate service entrance cable.

HAZARD ABN and UBN SERVICE ENTRANCE CABLES

An adequate wire for all ordinary service jobs. Imprinted every 2 feet. Six standard colors. National Electric Code Standard.

HAZACODE FIREKROME BUILDING WIRE

A super-adequate wire for all important jobs. Super-aging and heat-resisting. Smaller sized copper carries your load.

HAZARD PERFORMITE WIRE

For adequate wiring in moist places. Replaces lead encased cable. Approved by Underwriters Laboratory per Section 3035 National Electric Code.

HAZARD WATERTITE WIRE

An adequate cable for interior wiring jobs. A new Hazard product, standard in construction and fully approved.

HAZARDEX NON-METALLIC SHEATHED CABLE

For adequate wiring on remodeling jobs use the cable with rip-cord for easy working and with flame-resisting, moisture-proof paper sheath between conductor and armor.

HAZARD ARMORED CABLE

An adequate cord for floor lamps, table lamps, radios, electric clocks, etc. A rubber sheathed, parallel lamp cord that is safe.

PERMEX LAMP CORD

For adequate protection on short runs or where many bends must be made, use

HAZARD FLEXIBLE STEEL CONDUIT

HAZARD INSULATED WIRE WORKS

DIVISION OF THE OKONITE CO.

WORKS: WILKES-BARRE, PENNSYLVANIA

New York Chicago Philadelphia Atlanta Pittsburgh Buffalo Boston Detroit Seattle Dallas Washington San Francisco St. Louis Los Angeles

ADEQUATE WIRING will help get these appliances OUT OF THE CLOSETS . . . and into use!

and . . .

HERE'S HOW the FUSTAT HELPS GET *Adequate Wiring*

It shows need for new circuits

Permanent overloading is positively prevented. Once the correct size Fustat has been installed it cannot be replaced with a larger size and tampering it in any other way is virtually impossible. If additional circuits are needed the user cannot side-step the issue at the sacrifice of safety.

It reduces low voltage complaints

The user cannot load the circuit beyond the proper capacity of the copper. This prevents a voltage drop that is so frequently the cause of complaints about toasters, percolators and other appliances not operating efficiently.

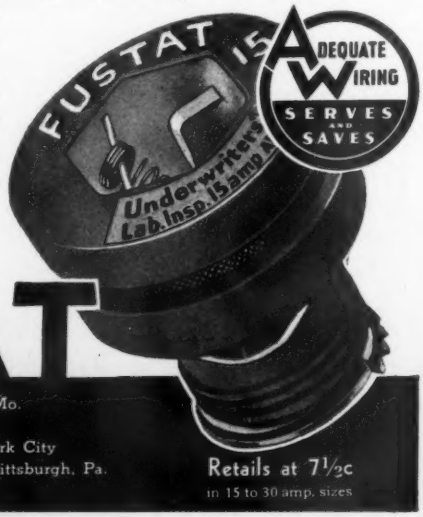
It permits adding more appliances to present circuits

A circuit can be loaded to approved capacity without needless blows and without sacrifice of safety. The long time-lag of the Fustat keeps it from blowing on motor starting currents or other harmless overloads.

It builds user confidence in doing things electrically

When users can add new appliances without being annoyed by needless blows . . . when their appliances operate properly because low voltage cannot be caused by overloading . . . when users get real protection against dangerous cord shorts, such as only a proper size fuse can give . . . when users begin to think of the protective device as a desirable safeguard instead of a nuisance . . . then they will become more thoroughly convinced that the electrical way is the right way to do things . . .

—and right here is where the Fustat comes in to help get old appliances out of the closets onto the line — and to assist the whole industry build towards bigger and better times.



If . . .

USERS let their appliances gather dust in closets because inadequate wiring prevents getting satisfactory service from them . . .

DEALERS can't readily sell more appliances, and . . .

CONTRACTORS get few calls to install new wiring since users don't make full use of present circuits, and . . .

CENTRAL STATIONS lose revenue and find resistance to building up the more profitable domestic load . . .

Then Everybody in the Industry Loses Profits

WHAT IS THE FUSTAT?

It is a fuse to which a thermal cutout is added.

It protects like a fuse against short circuits — even high resistance shorts such as occur in flexible cords.

It protects against permanent overloads, even when as light as 25%.

Yet it will not blow on motor starting currents of washing machines or other appliances.

Retails at 7½c

It has a base that guards against anyone robbing the circuit of protection.

It fits Edison base fuseholders through the use of an inexpensive adapter.

It's just good business to sell, install and use Fustats

The FUSTAT

For full information write to any of these firms

BUSSMANN MFG. CO., University at Jefferson, St. Louis, Mo.
JEFFERSON ELEC. CO., Bellwood, Ill.
KIRKMAN ENGINEERING CORP., 121 Sixth Ave., New York City
NATIONAL ELECTRIC PRODUCTS CORP., Fulton Bldg., Pittsburgh, Pa.
UNION INSULATING CO., 27 Park Place, New York City

Retails at 7½c
in 15 to 30 amp. sizes

JANUARY, 1939

Volume 19 No. 1

ELECTRICAL SOUTH

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JOHN C. COOK, Sales Promotion Mgr.
W. E. COOGLER, Production Manager

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ATLANTA, GEORGIA

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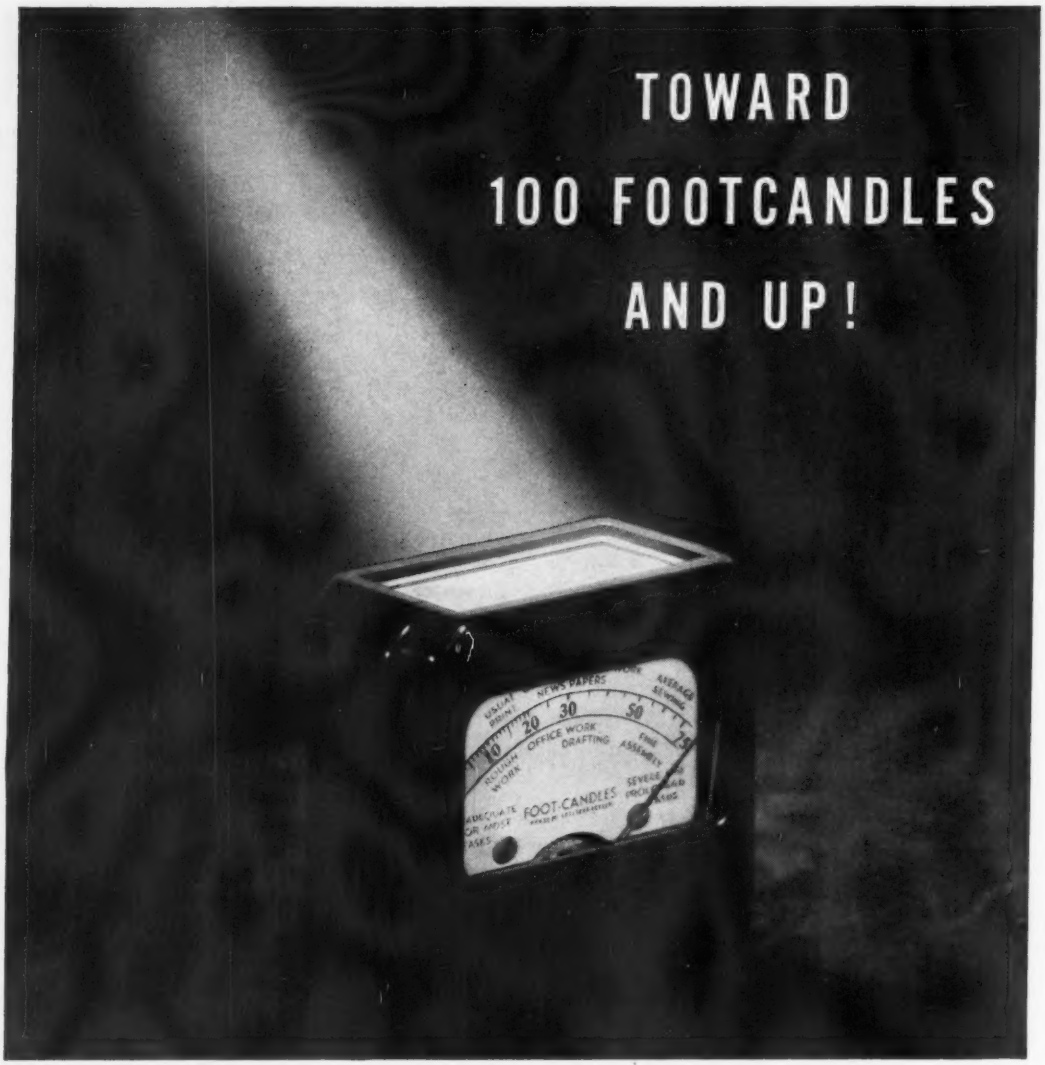


Why Fluorescent Lamps offer a new promise of ideal lighting

THE Science of Seeing has demonstrated the desirability of greater quantities of light for better seeing.

Until now, with incandescent lighting alone, high levels of lighting for "daylight" illumination have been difficult to obtain without excessive heat and cost.

The fluorescent lamp in the future should offer a new means of obtaining daylight quality with coolness, softness, and color-value, in amounts of 100 footcandles and up.

In obtaining these levels, it is not a matter of replacing existing footcandle levels with less power . . . nor of obtaining higher footcandle levels with the same power—a situation that existed when the tungsten filament lamp was introduced many years ago. It offered the public a better and more efficient way of lighting.

And so today, in approaching the goal of ideal lighting, both from the standpoints of quality and quantity, fluorescent lighting inevitably means more kilowatt hours because, historically, higher efficiencies have always increased power consumption. For if fluorescent lighting can be used for obtaining general illumination of 100 footcandles or more, as contrasted with the five, ten, and twenty footcandle levels found today, it cannot help but produce greater connected load.

By thinking and talking in terms of "shade of porch" lighting (250 footcandles) both as to quality and quantity, it won't be long before a few concerns will want to have that kind of lighting installed. They will use it over longer hours, and more constantly. And they will be the forerunners of many others.

In most cases, for some time to come, fluorescent lighting will be used as a plus to incandescent lighting, and vice versa.

With the lighting business so far from the saturation point, a proper presentation of fluorescent lighting can benefit everyone in the lighting business . . . the consumer, utility, fixture manufacturer, jobber, retailer, and manufacturer. General Electric Company, Dept. 166-ES-A, Nela Park, Cleveland, Ohio.

GENERAL ELECTRIC

The Need for a Better Dealer Program

By D. S. Stophlet*

THE recent rapid increase in dealer activities has created a number of problems in the electrical industry and it is in the solution of these problems that the electrical leagues can be of the greatest value. 1937 and 1938 saw a wave of price selling. Price, was all the dealer talked. Quality and the principles of specialty selling were forgotten.

Now we must return to those principles on which the appliance industry was founded and do constructive creative selling. The electric leagues can help greatly.

The successful dealer is a very independent personage, very much a "rugged individualist" — and that's why he is a dealer, and all plans to secure his cooperation must be tailored to fit this fact.

Sales plans and promotions by electrical leaguers should be presented to a group of the leading dealers of the locality for their consideration before final adoption and every effort made to make them flexible so as to meet all kinds of dealer operations.

In this connection the greatest care should be used in the selection of the personnel that directly contacts the dealer. Try and secure men who have had actual front-line-specialty experience in major appliance selling as a dealer or salesman.

Dealers Aided Materially

In some conferences held last spring we received some very interesting reactions concerning the activities of different electrical leagues. It was uniformly agreed that where the leagues were in operation that they had helped the dealer very materially—

(1) In securing cooperative advertising allowances for dealers.

(2) In furnishing home economic assistance and other sales promotional activities.

(3) In increasing the public acceptance of the general public for electric cookery and for the advantage of hot-water heating.

In every case where one of these dealers was operating in an electric-league area, the dealer voluntarily gave great credit to the league for its efforts.

Same Selling Tools Offered

Whenever utilities are merchandising it is very essential that the dealer be furnished with the same selling tools as the utility salesman, namely:

(1) Time payment plans.

(2) The same trade-in allowance for used equipment.

(3) Demonstration privileges on ranges, etc.

(4) Close-out specials.

Without doubt, the most highly appreciated dealer cooperative assistance is financing by the utilities of dealer time paper. However, the policies of many utilities do not include financing so an arrangement whereby the dealer can use the same time-payment rates as the utility is very helpful to the dealer.

Too much emphasis cannot be placed on providing adequate finance plans for the dealer whether by commercial finance companies, local finance companies, E. H. F. A. or utilities. 85% to 90% of all electric appliances are now being sold on some form of deferred finance plans.

It is difficult in some localities for small dealers of good moral worth but limited finance rating to secure finance accommodations from the big commercial finance companies. If the electric league, through any of the above agencies, can help to remedy this condition by supplying a financial service for the dealers it is always helpful to the dealers.

Distributors Consulted

When a utility puts on a campaign, the league should consult with all distributors and should arrange so that all dealers should have comparable offers available.

There is no doubt that this matter of man power is one of the most serious problems confronting the dealer. The electric appliance industry, particularly the refrigeration industry, was built by the industry, application, and perspiration of the specialty salesmen. Where have the men of that fine profession gone? For it was a profession worthy of the name.

These salesmen, thousands of them members of the Manufacturers' Honor Sales Organization, men who were proud to be called specialty salesmen and who earned consistently their $2,500 to $3,000 a year. Where are they today? Many are holding down managerial and executive positions

ELECTRICAL appliance dealers will welcome the practical suggestions offered by Mr. Stophlet at the recent conference of the International Association of Electrical Leagues.

Discussing the need for a better dealer program, he emphasized that the dealer should be considered when promotion plans are formulated; that dealer conferences be held; that dealers be provided with the same selling tools available to the utilities; that assistance be rendered in the training of salesmen; and that the league idea be extended to smaller cities.

*Excerpts from an address made at the Third Annual Conference of the International Association of Electrical Leagues, Nov. 18, 1938, Philadelphia, Pa. Mr. Stophlet is associated with the range sales department of Westinghouse Electric & Mfg. Co., Mansfield, Ohio.

but there are very few new men coming on to fill their places.

Why is this? It is the fault of the electric industry, because for years we have rather looked down on this specialty salesman as useful but not absolutely necessary to the industry, and we have made little effort to replace him. As a result, very few younger specialty men have been taken into the industry. We need more salesmen for the dealers.

Need for Trained Men

I suggest that the electrical leagues carefully select young men and train them carefully for positions with dealers. Arrange for night schools for good men who are in blind alley jobs but who want to get out. These men have minor jobs at $15, $18, $20 a week, but many of them are excellent salesmen material. Train them at nights so they can hold their present jobs until they feel prepared to sell electric specialties on their own. Then locate them with good dealers.

But in turn, the dealer must agree not to compete with the new salesman, to give him his regular floor days, his carded prospects and help him close a few sales in order to get started. Only too many dealers, as soon as a salesman begins to make his $150.00 or $200.00 a month discourages him by cutting his commission, his territory, or by adding more salesmen until the law of diminishing returns sets in and all his salesmen are on the verge of quitting because of marginal incomes.

What we need is better salesmen and opportunities for them to earn $200 a month as a minimum. The electric league can help all dealers in their areas immensely by:

(1) Training and placing new salesmen.

(2) By making better salesmen out of existing dealers' salesmen through intensive practical courses, by practical men who have had front-line-specialty selling experience.

At our dealer conferences, the point was brought out that the influence of the electric leagues should be extended to the smaller cities. I do not know whether or not you have tried to organize leagues in the towns of 50,000 and under but I would consider these towns ideal places in which to extend your activities.

The dealer in these towns needs your support and activities. Several of the dealers attending our dealers conference spoke of this fact.

Approximately 26% of our total wired homes in the United States are in towns of 2,500 and less and on the farm. The dealers covering this, over one-fourth of our meters, need assistance. This is shown by the lower saturation figures of appliances in these towns and on the rural lines.

The matter of promoting the sale of electric appliances is like a great chain. The utilities, the manufacturers, the electric leagues, the distributors, the dealers and finally the public are all linked together.

The weak links of this chain at present lie in the multiplicity of the weak unqualified dealers. Just as a chain is no stronger than its weakest link, so our chain of promotion, starting with strong, well-forged links of utility, electric league and manufacturer, begins to weaken with the distributor who over-dealerizes his territory and breaks badly when it reaches the low producing dealer. The industry should clip off a number of these weak low-producing dealer links in order to strengthen the other links.

Thousands of small operators who were unsuited by either lack of finances, inclination or training for their job, rushed into the business, with disastrous results for those established, well qualified firms. The era of destructive competition was at hand and it has been growing ever since.

Fewer and better dealers is the only answer; controlled distribution with fewer well qualified dealers instead of a host of unqualified ones who make it difficult for a legitimate dealer to make a profit. Let's return to the basic principles of specialty selling and attract the right kind of dealers and salesmen to the business.

Suggested Procedure

My suggestion is first a careful re-analysis of each territory in question. This should include a large wall map of each section of a city; and should show:

(1) The number of domestic meters.

(2) The type of territory — high, medium and low-income groups, and foreign language areas.

(3) The saturation by appliances.

(4) Most important of all—the number of dealers, what type they are, the manufacturers they represent, and their rating—high, medium or low producers.

With this information at hand, every effort should be made first with the different distributors involved to reach an agreement as to the number of dealers and type that are to be placed in any one territory.

It has been found from experience that a town of 30,000 is the minimum sized town that can possibly be expected to support two full-line appliance dealers of any one manufacturer.

In large metropolitan areas, no yard stick has as yet been put forth due to the multiplicity of local conditions.

"Qualified Dealers"

The local electric leagues, conversant as they are with local details, are in an ideal position, therefore, to be of inestimatable value to the electric industry by setting up local qualifications for a "certified dealer." Qualifications should include:

(1) A place of business.

(2) Representative stocks of the appliances he is handling.

(3) Proper displays of the same.

(4) A service and sales organization.

(5) A minimum advertising program.

(6) A minimum sales and performance quota.

In return for qualifying as a certified dealer, the electric league would arrange for the dealer to:

(1) Receive automatic membership in the league.

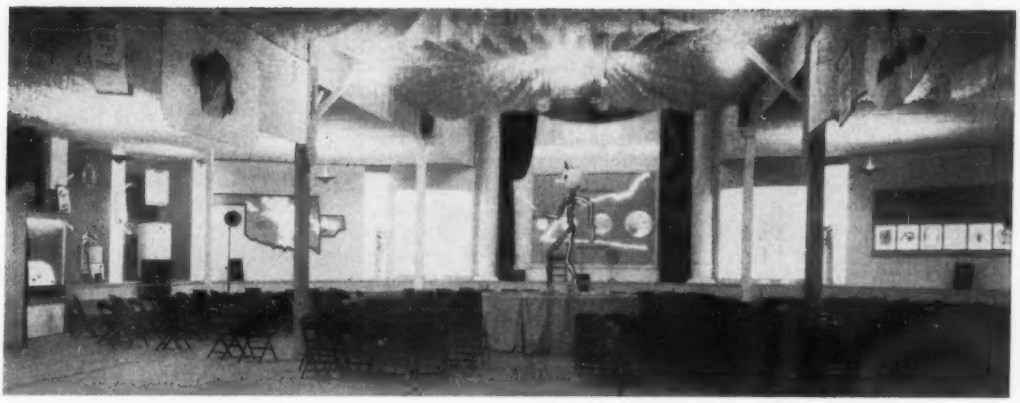
(2) Make available to the dealer a time-paper service with the recourse, and on standard terms of credit either through national or local finance companies or the utility if their policies include financing.

(3) Share a part of the leaders' advertising expenses on acceptable advertising.

(4) Make available to the dealer sales promotion programs and the use of the utility's home economics service.

(5) Supply a sales analysis of the dealers' territory with lists of

(*Continued on page* 34)



Facts about the company's business were discussed before large groups in this exhibit of the Oklahoma Gas & Electric Company and cooperating dealers and distributors at the Oklahoma State Fair

Cooperative Exhibit Brings Electrical Facts to Oklahoma Fair Visitors

RECOGNIZING the value of a state fair as an opportunity to present their equipment to large numbers of prospects, more than twenty electrical equipment and appliance dealers and wholesalers cooperated with the Oklahoma Gas & Electric Company in presenting one of the most extensive electrical exhibits ever undertaken in Oklahoma.

The exhibit was sponsored by the utility which rented and decorated the building, a structure containing approximately 24,000 square feet. One entire end of the building was devoted to the utility company's exhibit while the remaining space was divided into booths for dealers and distributors.

"Electricity is cheap!" was the theme of the power company exhibit. "Harnessed horsepower" was the catch phrase emphasized in the exhibits of dealers and distributors, whose exhibits included all major electrical household appliances and radios, as well as farm power equipment such as feed grinders, pumps, milkers, churns, electric fences, etc.

Action displays and appliance demonstrations were used effectively in a number of the exhibits.

The Mideke Supply Company, Oklahoma City, a distributor who handles home power tools, kept a crowd around its booth watching figures of Reddy Kilowatt being cut out with a jig saw. These cutouts were given away for souvenirs to lookers-on, who at times stood four and five deep watching the demonstration.

Action Displays Effective

Portable electric cookers and electric coffee makers were featured at a utility company-sponsored booth, where home service demonstrators cooked and exhibited food and otherwise demonstrated these appliances.

A blind lady ironed clothes on an electric ironer in the booth sponsored by Patton's, Oklahoma City appliance dealer.

Hales-Mullaly, Inc., wholesale distributors, made recordings at their booth as final awards to winners in home talent contests sponsored by radio dealers in various cities of the state.

An electric fence demonstration proved especially interesting to farmers, a number of whom placed orders.

A. A. Brown, general sales manager of the Oklahoma Gas and Electric Company, was in charge of the show.

"While the value of this sort of promotion cannot be measured in immediate results," Mr. Brown pointed out, "dealers augmented appliance prospects and a number of direct sales were made."

One entire end of the building was occupied by a company exhibit, where at frequent intervals (approximately once each hour) a 15-minute performance was given. While information conveyed was educational in point and designed to emphasize the low cost of electric service, the manner of presentation was dramatized to the extent that the 350 folding chairs provided, were filled to overflowing at every performance.

"Last year's puppet show, sponsored by the Oklahoma Gas and Electric Company, drew huge crowds," Mr. Brown said. "Fair crowds want to be entertained, not to be educated, hence our dramatizations were carried on, not in any set manner, but in a more or less jovial fashion by an 'unseen voice' with the aid of loud speaker equipment."

To attract a crowd, performances opened with a vaudeville act, put on by a sleight of hand artist, who also did a ventriloquism act, the entertainment being interspersed with jovial talk and wise-cracks by the 'unseen voice.'

Then in presumable prepara-

tion for another act, Reddy Kilowatt was asked to fill in. Outlined in neon tubing and holding a neon pointer, an eight-foot-high figure of Reddy Kilowatt standing on a pedestal in front of the exhibit, immediately flashed into prominence. And from there on, with the aid of the 'unseen voice' and the loud speaker, Reddy Kilowatt became the star performer in a three way demonstration designed to portray the history of the company, the comparatively low cost of electric power, and the monthly electric bill as a service charge rather than a 'light bill.'

As Reddy, endowed with the 'unseen voice', told pertinent facts concerning the electrical industry and the Oklahoma Gas and Electric Company, these facts were illustrated electrically on wall charts by means of lighting effects and neon tubing. The pedestal revolved as necessary so that the figure of Reddy Kilowatt pointed at the proper wall chart illustrating the points being discussed.

Presenting first, facts of the company's growth, Reddy pointed to a map of Oklahoma on the wall as he launched into a description of the company's properties when they began operation more than 35 years ago. Lights flashed on in the map to indicate the number and location of power plants, miles of transmission lines and area of service as described, until the entire area now served by the company was illuminated.

As facts were given as to the number of employees, amount of payrolls, amount expended for fuel and other items, especially taxes, Reddy's discussion naturally turned to cost of government. At this point, the pedestal revolved so that Reddy pointed to another chart, where cost of government and electricity rates were illustrated.

As the subject was discussed, neon tubing on the map flashed on to show the rising trend of government costs in the past thirty-five years, the climax being a streak of red showing the latest sharp rise. By comparative illustrations and neon tubing, it was shown that the trend in the cost of electricity has been slightly downward; that the cost of all electric power used in the country today, is equivalent to only four percent of the cost of government; and that electricity and fuel costs are only two percent of the average budget.

The third part of Reddy's program concerned the average home's electricity bill, which, as analyzed by Reddy, was shown to be not a light bill but a service charge. With his pointer directed at an enlarged reproduction of a typical monthly statement with the electrical appliances in a strip across the bottom of the bill, Reddy discussed tasks performed by electric appliances in the home. As each appliance was discussed, its picture on the bill was illuminated and the average cost of operation was set forth, until the average bill was shown to be a combined service charge on radio, washing machine, electric iron, vacuum cleaner, refrigerator, illumination, etc.

As a closing feature, lights were flashed on bringing into prominence two 'visionary' displays set up at each side of the center stage, behind heavy net curtains. One of these displays portrayed the housewife of 35 years ago, worn and bedraggled looking, laboring over a wash tub. On the other side was shown a modern smartly dressed housewife, her work all done by electric servants.

Tying in with the state fair promotion, the Oklahoma Gas & Electric Company ran advertisements in all the principal state newspapers (numbering around 35 or 40) in the territory served by the company. The main theme of the advertisements was "Electricity is Cheap in Oklahoma."

Ambitious Lamp Quota Set in Arkansas . . .

THE Arkansas Power and Light Company has adopted its most ambitious quotas in the light conditioning campaign opened in September to continue five months. Ten thousand I.E.S. lamps, 6,000 Pin-It-Up lamps, 24,606 cartons of lamp bulbs, and 4,000 Re-New-A-Lites make up the record-breaking quotas. The power company plans to push the sale of these lamps through its own organization, and has broken the quotas down to give each sales employee a definite goal.

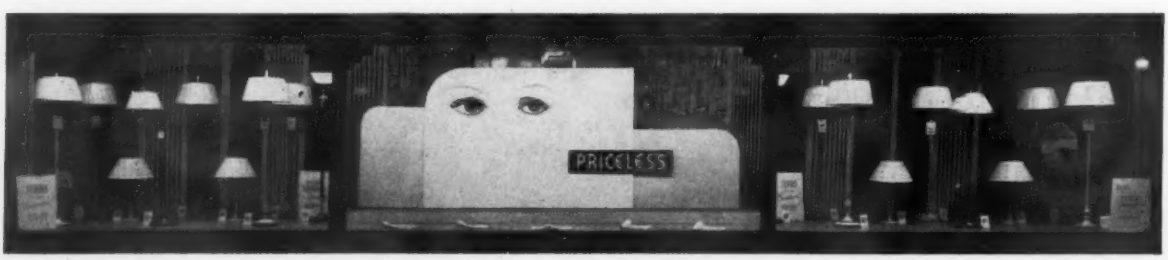
Several unusual sales aids are being used in the campaign. The Sales Promotion Division of the sales department has issued manuals, one prepared especially for dealers, the other for key sales employees. *Geared Sales*, the monthly dealer publication of the power company, is stressing light conditioning in its issues through the campaign.

An unusually attractive window has been arranged in the Little Rock show rooms of the power company. This window, impressive in its simplicity, carries out the idea that eyes are priceless, and I.E.S. lamps grouped around a large pair of eyes carry out the theme of the need for good light.

The use of a large pair of eyes is being used on signboards used by the company during the campaign, along with the catch line, "Good Lighting Is Your Cheapest Insurance."

The campaign was launched at a series of meetings of employes, at which the plan was presented by J. F. Tuohey, commercial sales manager, and Charles T. Evans, special representative of the power company.

One of the effective lighting window displays used by Arkansas Power & Light is shown below. .



Contracting

IN THIS SECTION:
Fluorescent Lamps Provide New Lighting Tool
Billing "Time & Material" Jobs
Installation Data on Fluorescent Lamps

News From the Field On Adequate Wiring

A RECENT report from the National Adequate Wiring Bureau states that there were 114 utility companies promoting adequate wiring by mid-December. These companies are located in 44 states and have a total coverage of 12,135,000 residential meters. A similar breakdown, indicating utility companies who have received information about the national program but are not yet actively promoting wiring, totals 41 companies, in 24 states, with a coverage of 1,600,000 residential meters.

* * *

Adequate wiring will be included as a part of the all-service sales program of the Dallas Power & Light Company during 1939. Contacts will be made by company salesmen with all residential customers. Those planning remodeling or building of new homes especially will be urged to include certified adequate wiring. P. M. Rutherford, secretary-treasurer of the Dallas Adequate Wiring Committee, reports that work with architects and promotional builders has been carried along and that a number of new homes will be ready for certification in the near future.

* * *

The Charlotte Adequate Wiring Bureau has created a novel adequate wiring display in the form of a drawing, six feet by eight feet in size, of a typical floor plan on which are designated the necessary outlets. A small lamp is mounted behind each symbol of the wiring device shown on the floor plan and these are connected with switch button controls on a counter on which the wiring device in question is mounted. Originally shown in the local Bureau's booth at a Lighting Show, this exhibit is now on display on the sales floor of the Duke Power Company in Charlotte.

The Charlotte Adequate Wiring Bureau also reports the presentation of its first adequate wiring certificate. E. V. Sapp, a local wiring contractor, wired the home, which was built by Walter Nivens.

* * *

Twenty-four sheet billboards are being used by the San Antonio Public Service Company to give further impetus to the adequate wiring program. The message, as well as the illustration on these boards, is a facsimile of the window display poster of the National Bureau. Edward A. Gauthier, sales promotion division, states that these painted, illuminated boards are located on the main traffic arteries in residential areas.

* * *

More than 10,000 persons visited the first certified adequately wired home recently opened to the public in Birmingham during a two week period. This home is all-electric and features an up-to-date layout of Better Sight lamps and lighting fixtures. Roy H. Knox, supervisor, sales promotion advertising department, Birmingham Electric Company, advises that a number of other homes are now under construction that will have adequate wiring. D. B. Clayton of the Electrical Association of Birmingham presented Harry Pembleton, architect, with the first adequate wiring certificate.

* * *

Electrical interests in Roanoke, Va., are organizing to undertake an adequate wiring activity early next year. A general promotional meeting was held at the "Colonial House" of the Appalachian Electric Power Company on December 13, and addressed by A. C. Tait, field representative of the National Bureau.

Report Released on Wire Current Carrying Capacity

AFTER eight years of intensive research, the National Electrical Manufacturers Association has just published the final report of the findings of its Rubber-Covered Building Wire Section on the current carrying capacity of rubber-insulated building wire.

The report is entitled "NEMA Report of Determination of Maximum Permissible Current Carrying Capacity of Code Insulated Wires for Building Purposes." Data on performance and heat-resistant grades of insulation are covered as well as code grade.

Among the more important findings are:

1. Maximum operating temperature of 50 C for Code rubber, 60 C for Performance compound, and 75 C for Heat-Resistant grade. These values are for a 30 C ambient.

2. Values of current carrying capacity in amperes for conductors of sizes 14 Awg. to 2,000,000 cir mils, inclusive, for each of the three grades of insulation and for various conditions of installation.

Much other important information is also given such as a guide for selecting the proper values of current carrying capacity for each of 18 different wiring methods listed in the National Electrical Code; a historical summary of cable ratings; factors affecting current carrying capacity; determination of thermal surface resistivity of cable coverings and conduits; a-c resistance of conductors for all sizes of wire up to 2,000,000 cir mils, expressed as a ratio of a-c to d-c resistance; formulae for current carrying capacity calculations; correction factors for various ambient temperature; a study of some cable ratings based on the NEMA investigation.

Fluorescent Lamps

Provide new lighting tools of greatly increased efficiency and flexibility to supplement incandescents.

By Roy A. Palmer, Illuminating Engineer, Duke Power Company

ROMANCE has constantly been mixed with the lighting business. Perhaps it is because light affects the welfare and happiness of every human being. And that's been true since the beginning of time. The Bible tells about the creation of light and how the Lord then said, "The light was good" So today, as it was then, light is good, and we are still seeking better and cheaper sources of light so that everyone may enjoy more of it.

Just as the tungsten filament and the gas-filled lamp were epochal steps forward in the history of electric lighting, so today we have another sensational development—the fluorescent lamp. These lamps have no filament. For the first time, we have "daylight color" which is almost a perfect match for standard daylight without filters or combinations of light sources. For the first time, we have a variety of colors, pink, blue, and green produced directly without filters to absorb a lot of the light of colors not wanted; light sources that produce from two to more than a hundred times as much light for the current as from filament lamps; lamps that are 50% cooler than filament lamps.

These facts may not have the same kind of romance that makes a school girl's heart beat faster, but they have the romantic atmosphere of new profits that should spur the contractor into a gallop to get his share of this lucious lighting business.

A lamp as revolutionary as this needs some study on the part of everyone who is going to sell, install, or maintain a system in which they are to be used. Complete information will assist remarkably in creating prospects, in closing sales, and in finding new and unusual applications for these lamps.

Operating Principles

First, what is the fundamental principle on which this lamp operates? Fluorescence is a phenomenon in which certain materials glow visibly when exposed to invisible ultra-violet radiation. Mercury arcs generate ultra-violet radiation which heretofore has not been utilized for lighting since it is invisible and is not transmitted through ordinary glass. However, certain chemical powders coating the inside of a mercury arc tube act in the same manner as a transformer converting a low voltage to a higher voltage—the invisible, short wave-length or ultra-violet radiation is converted into visible light of longer wave-length. Each powder has its own characteristic color with which it responds to the ultra-violet excitation. Thus either pure colors can be obtained or by mixing the powders many tints can be produced, although for lamps now on the market the colors are standardized.

To demonstrate the application of these new lamps The General Electric Institute, Nela Park, Cleveland, prepared a number of exhibits. Some of these are shown on this and following pages. At top of page, fluorescent lamps are exposed on office ceiling. The cool light provided measures 30 footcandles at desk top level.

A tungsten filament lamp emits light consisting of all colors of the spectrum. To obtain a single color, all other colors must be absorbed by a filter. This is obviously a very inefficient manner of producing colored light. Green coated tungsten lamps for example produce only .3 lumen per watt. The new fluorescent lamp produces green light 200 times more efficiently.

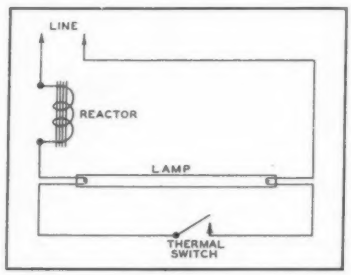
High Efficiency Achieved

The efficiency of the fluorescent lamps varies according to the color of light produced. The chemical used in the green lamps, zinc silicate, is the most efficient producing 60 to 70 lumens per watt. Blue light from the fluorescence of calcium tungstate will run approximately 20 lumens per watt. Pink produced largely with calcium silicate is rated at 20 to 24 lumens per watt. By combining these powders in proper proportion a white and daylight color of light is obtained. Since deep red and gold are not produced satisfactorily by fluorescence alone at the present stage of the art, the lamps producing these colors have a coating of colored pigment on the inside of the tube in addition to the coating of fluorescent powder.

The lamp itself is relatively simple. It consists of a tube coated on the inside with fluorescent powder with an electrode at each end consisting of small coils of tungsten wire. Since there is nothing else in the tube other than gas, the lamp is far more rugged than filament lamps of the same size and shape and will withstand considerably more shock and vibration. The electrodes are coated with an emission material, barium and strontium carbonates, which, when first heated by the filament, are broken down into oxides. These are mentioned because they have a bearing on the life of the lamp. There is a small amount of argon gas in the tube to facilitate starting, besides a small quantity of mercury to produce the short ultra-violet radiation.

When the current is turned on, the filaments heat up, vaporizing the mercury. The mercury vapor forms a conducting path between the two electrodes across which the resistance becomes lower with the increase in heat thus permitting more and more current to flow. To limit this current, a choke or reactor is necessary. The circuit shown in the diagram shows a thermal switch which opens when the electrodes have been heated. A surge from the reactor at that time starts the arc. The loss in the auxiliaries will range from 15 to 30 per cent of the lamp wattage. The power factor is from 50 to 60 per cent but it is reported that capacitors are to be incorporated in the auxiliaries which will improve this up to approximately 80 per cent.

Each lamp must have a separate reactor. While the reactor can be located at some distance away from the lamp without affecting its operation, wiring economy would dictate adjacent or nearby location since at least three individual wires plus one common wire for a group of lamps are required.



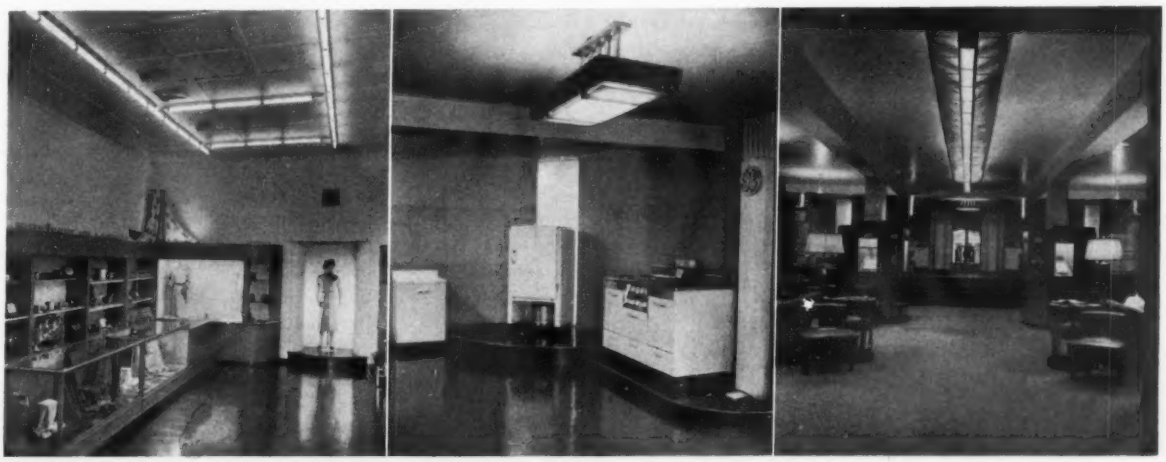
At frequent intervals, discussions occur regarding the low efficiency at which incandescent lamps convert energy into light. For example, a 40-watt filament lamp converts about 7 per cent of its input energy into visible light. The balance is mostly converted into heat. The 15-watt fluorescent lamp succeeds in converting about 13 per cent of its input energy into light.

One of the most interesting features of the fluorescent lamp is its low temperature. The electrodes generate heat to vaporize the mercury. After the arc is struck, it generates heat sufficient to keep the mercury vaporized but that temperature is relatively low compared to that attained in filament lamps. In converting ultra-violet radiation into visible light, the fluorescent powders do not generate any perceptible heat. Thus these lamps operate at approximately half the temperature of filament lamps—the first step toward producing "cold light."

When the lamps are operated outdoors during low temperatures, there is a tendency for the mercury to condense thus reducing the ultra-violet production and consequently decreasing the light output. Generally speaking, these lamps should be used indoors, and outdoors only in mild weather.

The fluorescent powders, or "phosphors" as they are sometimes called, are the heart of these lamps. They all appear white when viewed under ordinary light but when exposed to ultra-violet they glow in the characteristic color of the particular chemicals of which they are constituted. Since they are white and since they are coated on the tube interior in a thin, uniform film, some of the yellow, green and blue light generated by the mercury arc passes through the coating contributing about 3.5 lumens per watt to the light generated by the lamp.

The phosphors used, with the exception of that producing blue, have a slight phosphorescence, that is, they continue to give off some light after the exciting ultra-violet



At left, exposed lamps on ceiling and concealed lamps in cases bring out the full beauty of merchandise on display. In center, an example of adaptation of existing luminaire to new type lamps. At right, the fascinating pastel hues emitted by fluorescent lamps are mirrowed in this long luminaire of stainless steel. . .

is off. Thus when the arc is extinguished at each half cycle on alternating current there is no flicker or stroboscopic effect of any consequence. In the case of the blue lamp, however, the stroboscopic effect is quite marked.

The life of a fluorescent lamp is determined by the number of times it is started. Frequent starting of lamps causes eventual failure to start because the emission material on the electrode coils sputters off. Also, as the lamp is burned, there is a gradual loss of light produced as is the case with filament lamps. It is expected that at 1000 hours life, 70 per cent of the initial lumens will be produced. Since the high efficiency of this lamp is one of its prime values, users should be urged to replace them when their light output is reduced.

This point should be emphasized because this lamp has no filament to burn out as standard lamps have. As the lamp gets older, it becomes increasingly more difficult to start, and eventually will not start at all. Generally speaking, fluorescent lamps should have a longer useful life than filament lamps but decreased light output will dictate replacement periods rather than failure to operate.

Fluorescent lamps have practically unlimited applications. The colored lamps obviously will find ready use in places where decorative effects are desired such as in the theatres, hotels, restaurants, bars, etc. The most useful of them all, perhaps is, the daylight lamp. This is the first time that daylight quality has been produced directly without resorting to filters or to combinations of light sources. Wherever color discrimination or color matching is done, this lamp should be extremely useful. Inspection tables, show cases, silk counters, dress mirrors and numberless other places can use this lamp to excellent advantage.

In some places, difficulties have been encountered at dusk when daylight in a room is insufficient and yet artificial light seems to be ineffective. This may be due to the difference in color quality of daylight and artificial light. This is especially noticeable over drafting boards. The daylight fluorescent lamp will produce a color quality of light that blends more satisfactorily with natural daylight and this fact alone should help to sell new lighting in drafting rooms with individual units using one or more daylight fluorescent lamps over each drafting board.

The white lamp seems to be misnamed, for its light seems to be decidedly pinkish especially when this lamp is viewed adjacent to other fluorescent lamps. However, the illumination from the white lamp is quite close to that from ordinary tungsten filament lamps. In this connection it might be pointed out that in dress shops and similar places where goods are sold or inspected for use at night such as evening dresses, the white lamp should be used rather than the daylight lamp. Dresses and other materials which are to be viewed under ordinary artificial light should be sold under illumination from the white lamp. Street dresses, on the other hand, which will be viewed largely under daylight should be sold under artificial daylight from fluorescent lamps. In some places, a combination of both daylight and white lamps may be installed with a convenient switch to quickly bring into use the proper lamp desired.

While there are many applications which suggest themselves be-

(*Continued on page* 64)

Approximate Lumens Per Watt from Fluorescent Lamps

Color of Lamp	18″ T-8 15-watts	18″ T-12 15-watts	24″ T-12 20-watts	36″ T-8 30-watts
White	30	30	32	35
Daylight	30	30	32	35
Blue	18	18	19	21
Green	60	60	65	70
Pink	20	20	22	24
Gold	18	18	19	21
Red	3	3	3	3

Operating Data on Fluorescent Lamps

	18″ T-8	18″ T-12	24″ T-12	36″ T-8
Nominal lamp watts	15	15	20	30
Nominal lamp amps	.27	.33	.35	.30
Nominal lamp volts	63	50	65	115
Nominal line volts	110-120	110-120	110-120	208-230

Oscar P. Cleaver, illuminating engineer of Westinghouse Electric & Mfg. Co., here exhibits a display of fluorescent lamps and auxiliaries. Four thermal relay switches are shown at the top of the board and three magnetic type controls at the bottom. . . . . . .

HERE IS YOUR

January Special

DECORATED MODEL

Genuine SILEX

with upper bowl handle

PLUS MOLDEX TRAY

$3.75 value

For ONLY $2.95

10-CUP MODEL $4.25 VALUE, $3.45

RED TRIM MODELS SLIGHTLY HIGHER

THE GREATEST VALUE Genuine SILEX EVER OFFERED

Here is the special that keeps cash registers ringing as merrily in January and February as they did in December. Here is the special you can "take to town." Because it is the greatest value we have ever offered.

ELECTRIC SPECIAL

$6.30 VALUE ONLY $4.95

10-cup model $6.80 value only $5.45

Red Trim Models slightly Higher

This year's special has triple sales appeal. It is truly a "Treasure Chest Value." For it is the new Moldex decorated (not clear) model Silex Glass Coffee Maker — with upper bowl handle — and with individual serving tray — all for the price of a plain model Silex Glass Coffee Maker.

The Kitchen Special is the Decorated Kitchen Range Model — value $3.25 — plus an individual serving tray — value 50c — a total value of $3.75 for only $2.95. (Red trim a $4.15 value for only $3.25.)

The Electric Treasure Chest value is a very special model — not in our regular line. It is our regular $4.95 Delray Electric Table Model to which is added a decorative shell — value 35c — and to which is added the stove base with carrying handles — value 50c beyond the value of the plain base — and with which is included this individual serving tray — a 50c value — making a total value of $6.30 for only $4.95. (Red trim a $7.05 value for only $5.25).

In addition to the 8 cup size, we include in our special this year the new popular 10 cup size. Kitchen Range Model, 10 cup size, black trim, a $4.25 value for $3.45. Red trim a $4.65 value for $3.75. Electric Model, 10 cup size, black trim, a $6.80 value for $5.45. Red trim a $7.55 value for $5.75.

For bigger January-February sales and profits place your order now. Then display — talk — sell these "Treasure Chest" specials with triple sales value.

THE SILEX CO., HARTFORD, CONN., Creators of the Glass Coffee Maker Industry

On display at The National House Furnishings Show, Jan. 8 to 14, Room 612, Stevens Hotel, Chicago, Ill.

Flasher Display Sign

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WINDOW STREAMER

ENVELOPE STUFFERS

USE THESE SALES STIMULATORS

Installation Information on Flurorescent Lamps

By L. R. Keiffer

(The following discussion is reprinted by permission from the *Magazine of Light* published by the General Electric Company.)

A number of questions have arisen pertaining to the installation of fluorescent lamps from the standpoint of complying with the National Electrical Code. These questions involve:

(1) The maximum number of lamps that can be used on a branch circuit.

(2) How this number can be increased with power factor correction equipment.

(3) Description of power factor correction equipment available.

As a premise, the following interpretation is placed by us on the most recent rules of the National Electrical Code as they apply to the use of fluorescent lamps:

(1) Fifteen amperes are now permitted on 220-volt circuits as well as on 115-volt circuits. In either case No. 14 wire is, of course, the minimum size permitted.

(2) If No. 12 wire is used throughout, 20 amperes are permitted on branch circuits of either 115 or 230 volts.

(3) There is no longer any limitation on the number of sockets on one circuit, provided the ampere limitations are observed.

(4) Except when used with a grounded "Y," 230-volt 3-phase ilghting is not permitted.

(5) Except in the home, practically any circuit now supplied with 115 volts can be converted to 230 volts without violating any rule. In other words, entire circuits can be changed to 230 volts at the switchboard.

The fluorescent lamp, including the auxiliary which operates in series with it, has a power factor of about 60%. The current rating of this combination and not the wattage should be considered in calculating the number of lamps to be used on a branch circuit. This method of calculation eliminates the necessity of considering the additional wattage required by the auxiliary.

The following table shows the maximum number of lamps that can be used on a given circuit *if no power factor correction* is used.

MAXIMUM NUMBER OF LAMPS WITH NO POWER FACTOR CORRECTION

Lamp	Watts	Circuit Volts	Rated Amps.	Maximum Number of Lamps	
				15-Amp. Branch Circuit	20-Amp. Branch Circuit
18" T-8	15	115	.27	49	65
18" T-12	15	115	.33	40	53
24" T-12	20	115	.35	38	51
36" T-8	30	208 or 230	.30	44	59

Capacitor - transformers* are available for correcting a circuit power factor. This equipment draws a definite leading current directly from the circuit. The amount of current depends on the kva rating and is independent of the number of fluorescent lamps connected to the same circuit.

Obviously, the power factor correction takes place at the point where the capacitor-transformer is connected to the circuit. Therefore, placing the condenser at the panel does not reduce the lamp current in that part of the circuit between the panel and the lamps. Ir order to reduce the current in the line so that an increased number of fluorescent lamps can be placed on a circuit, it is necessary to connect the condenser at a point near the center of the fluorescent lamp load. This may mean placing the condenser in or on the ceiling. The 0.75-kva capacitor-transformer consumes about 54 watts and the wattage taken by other sizes will vary depending on the kva rating; provision must be made for radiating this heat if the device is put in an enclosed place. Otherwise, these equipments are self-contained, and may be placed in almost any desired location.

*These are in the form of a regular condenser operating from an intermediary transformer which connects across the circuit.

The following table shows the number of fluorescent lamps that may be connected to a given circuit when various sizes of capacitor-transformers are used as mentioned above. It takes into account the watts loss in the capacitor. The 0.75-kva capacitor-transformer will probably be the size most generally used for correcting power factor of large groups of fluorescent lamps.

MAXIMUM NUMBER OF LAMPS USING POWER FACTOR CORRECTOR

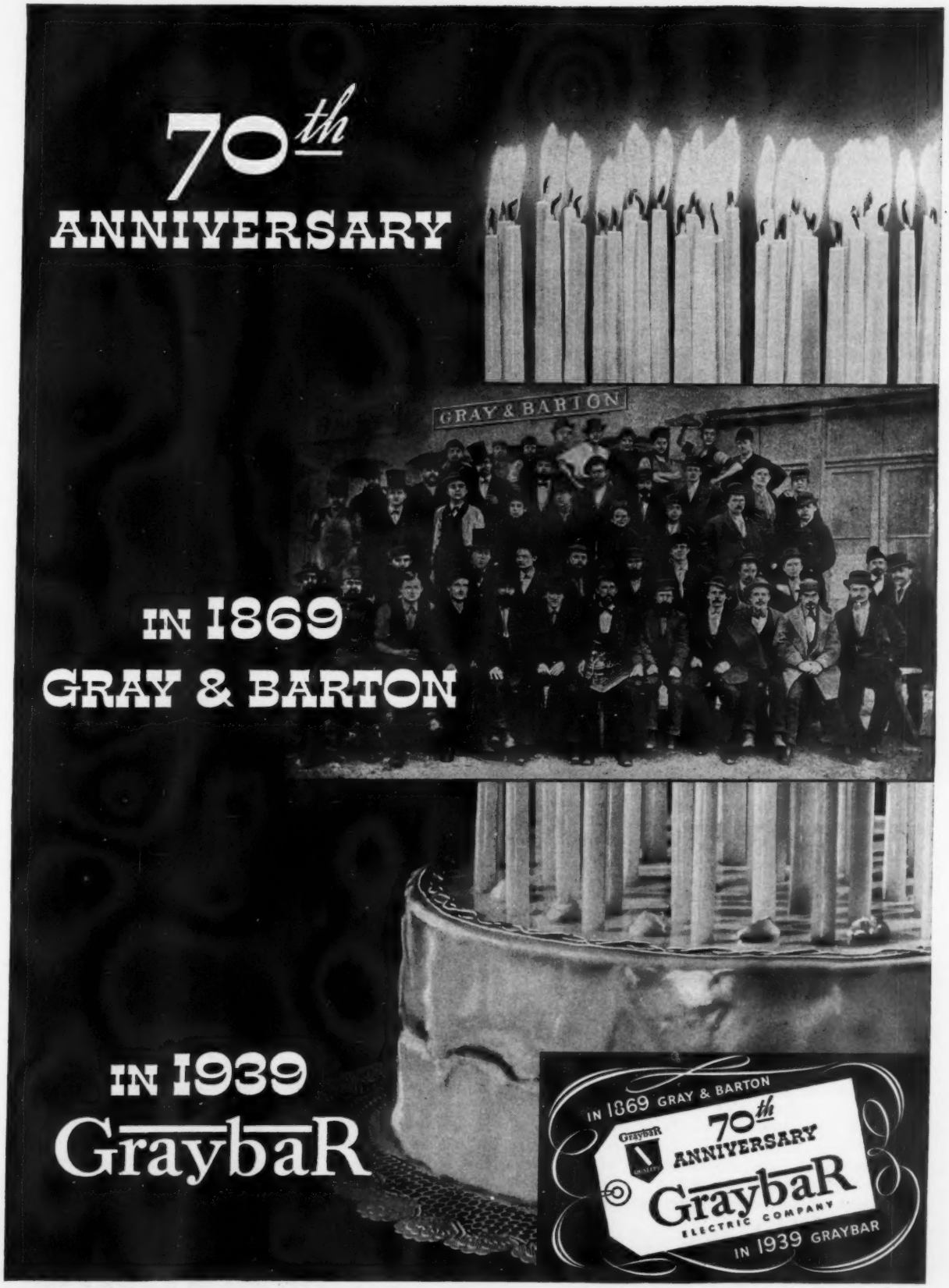
Lamp	Maximum Number of Lamps on 15-Ampere, 115-Volt Circuit for Given KVA Capacitor-Transformer				
	None	.25-KVA	.50-KVA	.75-KVA	1.0-KVA
18"T-8	49	55	59	64	68
18" T-12	40	44	48	52	55
24" T-12	38	42	46	50	53
	Approximate Power Factor for Above				
	.60	.68	.75	.82	.87

These data apply to either the thermal or magnetic switch auxiliary. No data is shown for 230-volt capacitor-transformers. Since forty-five 36-inch lamps or 135 feet of tubing can be used without power factor correction, it seems likely that the capacitor equipment for individual circuits will not be required for these lamps. However, very large capacitors, 1.50 to 7.50 kva, properly find an application in correcting the power factor of an entire installation.

Cooperation With P.-T. A. Helps Lamp Volume . .

A line-up with parent-teacher organizations in the city has more than doubled lamp sales for the Anniston Electric Company, Anniston, Ala., reports Frank Kirby, president. On the sale of the nationally advertised "Sight Saving" carton at 95 cents each, he allows a special commission of 10 cents to the P.T.A. for each carton sold by one of its members.

Members of the P. T. A. are allowed to sign receipts for a supply of the lamps and to pay for them as they sell them. This plan particularly gets all the school business which is quite substantial in itself.



OFFICES IN 83 PRINCIPAL CITIES FROM COAST TO COAST

Billing "Time & Material" Jobs

Are itemized invoices desirable in billing this class of service?

ELECTRICAL contractors who do a large part of their "volume" on a non-competitive basis are looked upon as having arrived. By non-competitive I refer to the type of business known as "time and material work." Business obtained on this basis is usually profitable because a large part of the expense of estimating is eliminated. It is usually obtained on a basis of satisfactory service rendered rather than on a price basis.

Furthermore, it is always a source of satisfaction to electrical contractors to have customers continue year after year to give them business on a non-competitive basis because they are satisfied with the service you have rendered in the past and consider your charges fair.

Ignorance of business fundamentals on the part of many contractors has, in many localities, resulted in educating the contractors' customers to the belief that a markup of 10% or 15% on prime cost is ample margin. As a consequence of this it has been difficult for the contractors "who know what it is all about" to obtain a fair price for time and material jobs.

Therefore, many contractors are reluctant to take work on this basis; they seem to have more difficulty with their customers on jobs taken this way than they do working on a contract basis. Perhaps some of you have had the misfortune of losing a good customer who has given you a great deal of time and material work because he feels that he has been mistreated or overcharged. If so you, no doubt, are skeptical of this type of business. So, let's try to analyze why time and material jobs are so full of grief.

When a job is taken on a contract basis, the price is established before the work is started: there is a thorough understanding between the contractor and the customer as to what the job is going to cost beforehand. Thus the chances of misunderstandings are almost entirely eliminated.

By Wm. G. Hazel*

President, Henderson-Hazel Corp.
Cleveland, Ohio

On the other hand, time and material jobs are frequently an unknown quantity. By that I mean that a customer seldom knows in advance exactly what he wants done and as a job progresses the customer's ideas grow more expansive and invariably the work done by the contractor amounts to more than the customer figured on spending. Therefore, there is apt to be a feeling of dissatisfaction between the contractor and his customer.

Misunderstandings Avoided

In many instances we believe these misunderstandings can be avoided if we give more consideration to the form in which the bill is made out. As an example of why dissatisfaction sometimes creeps in between a contractor and his customer, let's analyze a typical time and material job for an industrial plant:

The purchasing agent calls up and tells you that they want the motor on machine No. 7 moved to machine No. 10. You do the job and it takes some material and about a day's labor. The superintendent of the plant suggests that while you are there you might as well fix the switch on the second floor and before you are through you have done a half-dozen other jobs requiring several times the material and much more labor than was necessary to complete the original job.

Naturally, if you render an itemized bill for the materials used and the number of hours of labor involved, the bill is sure to be "out of line" in the opinion of the person who gave the original order, because you have actually done many other jobs at the request of the superintendent and your itemized bill simply states the quantity of material used and the number of hours of labor involved for all of the work.

But if on your bill you had stated—"To moving 5 h.p., 1750 r.p.m., 60 cycle motor number so and so from machine No. 7 to machine No. 10, including necessary conduit wire, fittings and services, so much money"—you would have told your customer what you have done for that portion of the bill.

Then, if you state the other work that you have done in a similar manner, I am confident that your bill will be more understandable and acceptable to your customer, because the chances are that he is most interested in what you have done, and if your charges are consistent with the work performed, the average customer will seldom complain.

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*Adapted from an address presented before the annual convention of N.E.C.A. held in Detroit, Sept. 12-15, 1938.

Many electrical contractors and dealers have found a service offered by Mr. Hazel's firm of particular advantage in this matter of pricing and billing. Further information about this service, known as the National Price Service, may be obtained by writing the company.

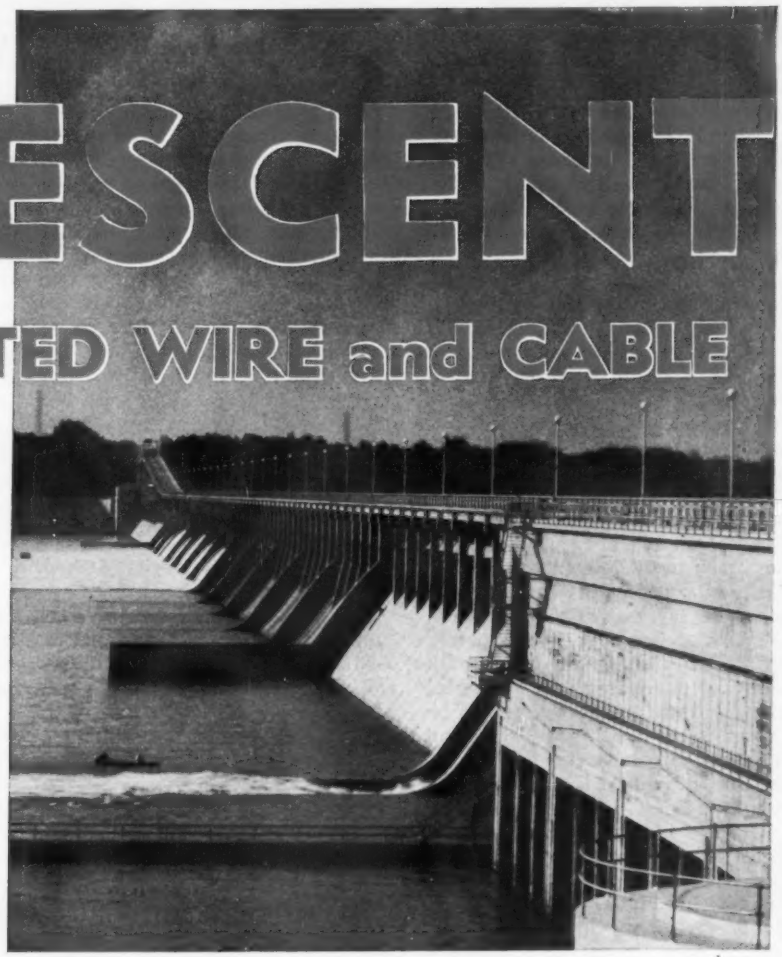
VARNISHED CAMBRIC • RUBBER POWER CABLES • BUILDING WIRE • RADIO WIRES • SIGNAL CABLE • FLEXIBLE CORDS • LEAD-ENCASED AND PARKWAY CABLES • ARMORED CABLE

CRESFLEX NON-METALLIC SHEATHED CABLE • SERVICE ENTRANCE CABLE • MAGNET WIRE • BARE WIRE

CRESCENT

INSULATED WIRE and CABLE

Utilities Use It!



The All Important Link between Power Source and Home and Factory

Today, we live electrically—and literally millions of feet of wire and cable, to provide power for industry and current for home lighting and appliances, bear the Crescent name. For wire and cable to meet every electrical need, look to Crescent and its corps of qualified Electrical Wholesale Distributors and Sales Representatives throughout the nation.

CRESCENT
INSULATED WIRE & CABLE CO. INC
TRENTON, NEW JERSEY

SOUTHERN REPRESENTATIVES

ATLANTA, GA.
Edgar E. Dawes
A-4 Rhodes Bldg. Annex

NEW ORLEANS, LA.
Paul Hogan, Jr.
805 Levert Bldg.

CRESCENT ENDURITE SUPER-AGING INSULATION • WEATHER-PROOF WIRE

I know it is the general practice among contractors in billing time and material jobs to itemize their bills and extend the price of each item of material, indicate the number of hours of labor and the rate per hour and extend that. I wonder if we who have been in the electrical business for so many years realize that to the average customer an itemized bill for electrical work is confusing at best, and the form in which a bill is made out, in our opinion, has a decided bearing on the customer's frame of mind.

Let's take, as an example, the natural questions that we raise in the mind of our customer when we send him a bill for time and material work listing all the materials and extending the prices, as well as the number of hours of labor and the rate per hour.

It is perfectly natural for the customer to make comparisons, in fact you are virtually inviting him to check prices with your competitors, or compare your prices with those he would have paid had he purchased the material directly from the supplier. Furthermore, on a bill for a time and material job, labor is usually the largest individual item on the bill and stands out like a sore thumb.

In case your customer does not question the price on materials, the mere fact that labor is the largest individual item will undoubtedly "draw his fire." It is always easy after a job is finished for your competitor to say that he would have done the job for less or that he does not charge that much per hour for labor. As a means of avoiding comparisons, we believe it advisable to state on your bill the work you have done rather than the material and labor you have supplied for the money you are asking your customer to part with.

Certainly professional men as a rule do not itemize their bills, but I do not believe that the electrical contractor is at present in a position to render the type of bill that the medical profession use, that is,—"To professional services rendered—so many dollars or hundreds of dollars." Yet we who have received these bills usually pay them without question. It is not customary to ask doctors to break down their bills, chances are that we as a patient of the doctor know full well what he has accomplished; and I am confident that the customer of the electrical contractor is interested not so much in the number of items of material, or cost per item, or the number of hours of labor, as he is in what you have done for him.

I am a great believer in giving customers what they want in the form that is most acceptable to them provided the method chosen does not involve too much detail and expense, and that it can be accomplished without resorting to sharp practice or trickery. No one condemns the medical profession for sugar-coating their bitter medicine, so why not adopt the same principle in making out your time and material bills so that they will be more acceptable to your customer. I am confident that a great deal of misunderstanding can be eliminated if on your bills for this class of work you will state what you have done rather than the quantity of materials and labor supplied.

You will notice that I have suggested the word "services" be used instead of "labor" on all time and material billing. I think it is about time that we in the electrical business should discontinue the use of the word "labor" in our billing, and call it "services," because after all we are rendering a service and not simply supplying labor. Furthermore, when the public think of labor they usually think in terms of unskilled labor, whereas the electrical contractor by the nature of his business must employ skilled labor and, of course, his charges must be higher than for unskilled labor.

If you have itemized your time and material bills in the past, may I suggest that in the future you change your method of billing and tell your customers what you have done rather than the material and labor used on the job. If you change your method of billing this type of work, your customers may become suspicious of the change and insist on an itemized bill. If this is so, anticipate their request. Simply have a rubber stamp made reading as follows: "We will gladly supply an itemized bill upon request," and put that on every invoice you send out.

By telling your customer that you will gladly do something, chances are that he will not ask for it. But, if a customer does ask for an itemized bill send it promptly, and over a period of time I think you will find that your requests for itemized bills will be negligible and certainly it will eliminate a great deal ot detail work in your office. Try this plan of billing for six months. Perhaps it would pe advisable at the start to apply it only on small jobs—say less than $50.00. I am sure you will have less complaints from your customers and fewer adjustments to make, to say nothing of the saving of time.

There are several recognized methods of figuring time and material work. One is to figure labor and materials at cost, plus a percentage; or use some established scale of resale prices for materials, and labor at a fixed price per hour, or some combination of these.

Adequate Wiring Exhibit For World's Fair . . .

MILLIONS of visitors to the World's Fair in New York will receive a definite, practical message about the importance of adequate wiring in the home.

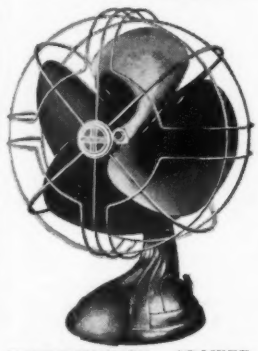
At the World's Fair, the homes comprising the Town of Tomorrow will be wired under the sponsorship of the National Adequate Wiring Bureau. There are 15 homes of various sizes, designs and prices in the group and it is anticipated that from 6,000,000 to 8,000,000 persons will visit this town.

This tie-in with the program is made possible through the farsightedness and generosity of a group of manufacturers and wholesalers who are providing the funds for the participation fee and supplying the materials for the wiring installations. The companies making this practical and valuable contribution to the adequate wiring movement are:

Anaconda Wire & Cable Company, General Electric Company, Graybar Electric Company, Inc., National Electric Products Corporation, The Okonite Company, Phelps Dodge Copper Products Corporation, United States Rubber Products, Inc., Westinghouse Electric Supply Corporation and General Cable Corporation.

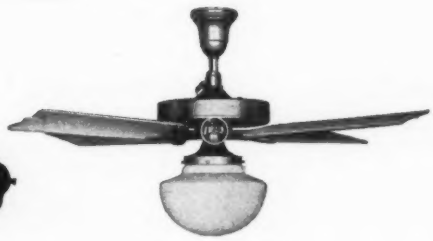
A simple, ingenious method of emphasizing the benefits to be derived from adequate wiring in each home has been devised. Reference to adequate wiring will also be contained in leaflets to be handed to every visitor.

AIR COOLING EQUIPMENT



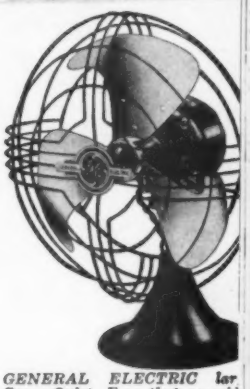
WESTINGHOUSE "POWER-AIRE"—with Ultra-Quiet Micarta blades, current-saving Capacitor motor, and Hamor-bronze finish. Provides "Hushed Coolness" for home or office. The deluxe fan of the complete Westinghouse line.

SIGNAL'S new Deluxe 16" Streamliner heads its 1939 line of Desk Type Fans available in a range of sizes from 8" to 16" in both AC Induction and Universal models.



Hunter Adaptair Hotel Type 52" Ceiling Fan. Instantly adjustable for either up or down draft.

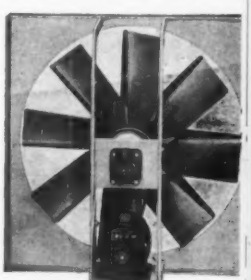
SAMSON Safe-flez rubber - bladed air cooler. Ideal for home and office use. Silent and economical in operation, streamlined and styled to stay modern. Rubber blades can't hurt a kitten's paw.



GENERAL ELECTRIC lar Super-Quiet Fan that provid large volume of air moveme with amazingly quiet operatio

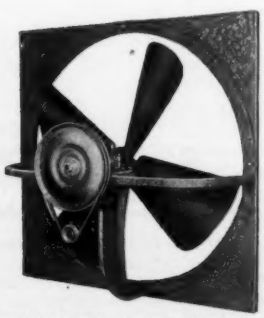
Advertisers In This Section:

American Coolair Corp.
Autovent Fan & Blower Co.
Buffalo Forge Company
Diehl Manufacturing Co.
General Electric Company
Hunter Fan & Vent. Co., Inc.
Samson-United Corporation
Signal Electric Mfg. Co.
Viking Air Conditioning Corp.
Westinghouse Elec. & Mfg. Co.

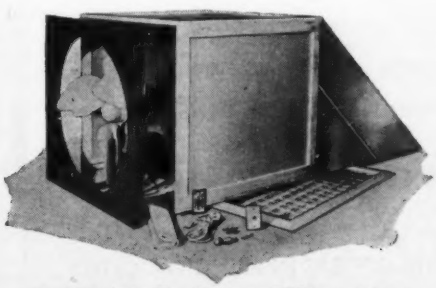


COOLVENT System of Cool and Ventilating for hom stores, clubs, apartments, e Forces hot, stagnant air fr attic space and draws co fresh air in. Capacities 3800 18,200 CFM with exceptiona quiet operation.

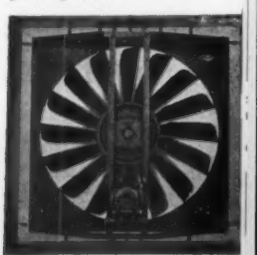
DIEHL Air Circulators: 20", 24" and 30" sizes. Single and two-speed oscillating and non-oscillating models. Floor, counter, wall and ceiling.



"BUFFALO" Breeze-Air Attic Fan for home comfort cooling. A large capacity fan that is unusually quiet and economical in operation.



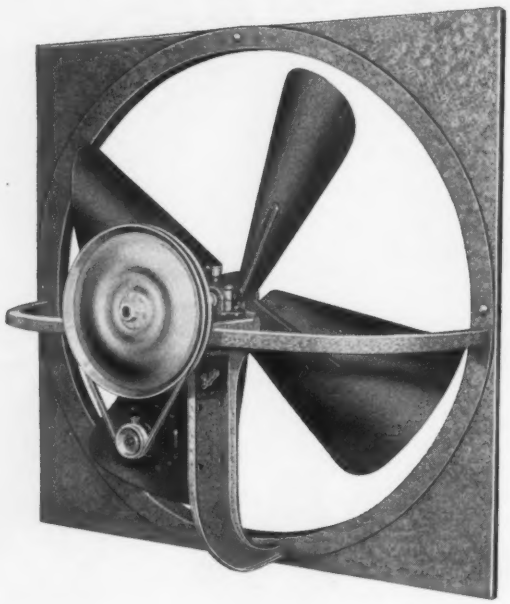
VIKING Attic Fan Package. Efficient streamlined design, with many new features. Complete kit includes all parts for quick, easy installation. Capacities 7,500 to 16,500 C. F. M.



The COOLAIR Residence Fa and its method of installati on springs.

There's No *Summer Slump*

for "Buffalo" ATTIC FAN DISTRIBUTORS



● More and more electrical distributors and dealers are finding that hot weather brings more sales and profits when they start a sales campaign on Buffalo Attic Fans.

Built by a company that has specialized in fan engineering for over 60 years, Buffalo Attic Fans are designed to render high-efficiency quiet operation at low cost for many years.

We back up your efforts with plenty of good advertising and sales promotion help. Remember, when you sell Buffalo Breez-Air Attic Fans you are selling top quality and performance—the only sure way to build customer satisfaction and more sales.

Some Valuable Territory Open

If you have a sales organization trained in specialty selling, we can offer you an attractive franchise and exclusive territory. Write us now for complete details. Summer will soon be here.

BUFFALO FORGE COMPANY
210 Mortimer St. Buffalo, N. Y.
BRANCH ENGINEERING OFFICES IN PRINCIPAL CITIES

Home kitchens, too, need VENTILATING FANS

There is a rapidly growing demand for Buffalo Kitchen Fans. They exhaust cooking odors and constantly change the air in the kitchen. Built complete with wall box ready to install. Write for our attractive proposition.

Mister..you'll want to LOOK INTO THIS

...If You're Interested In BIGGER FAN PROFITS IN '39

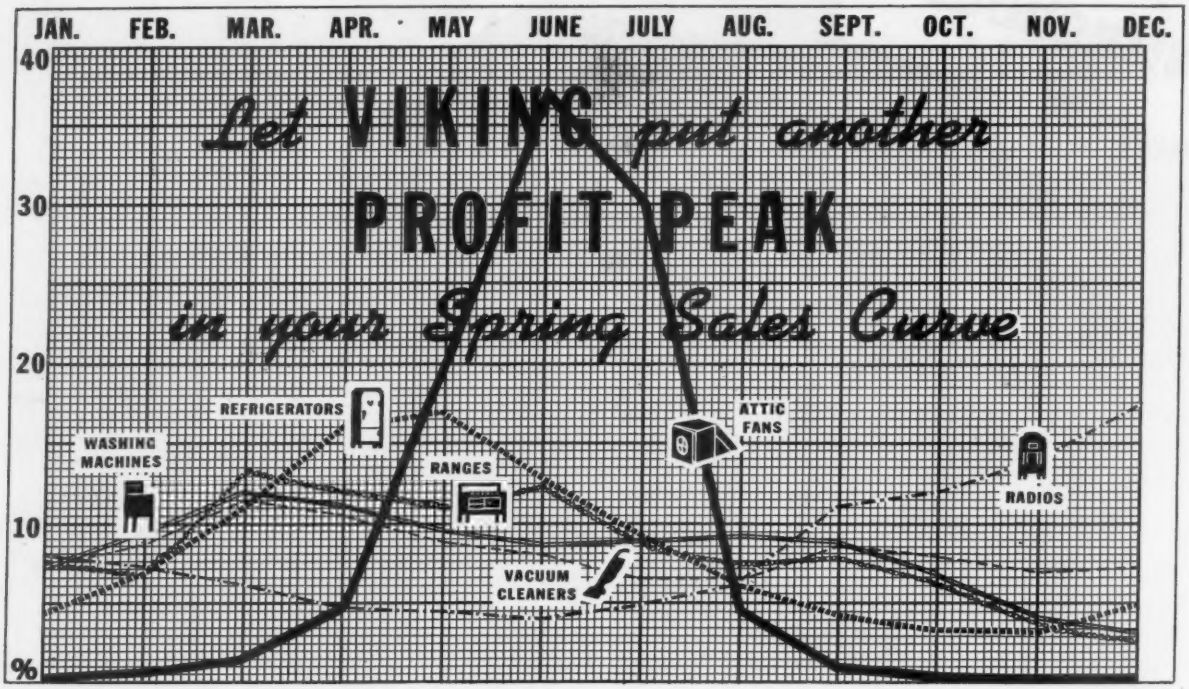
What sells fans for *you* when Old Sol turns on the heat? The best-known name in the field? Powerful national advertising? A reputation for quality and long life? A "hot" price special to bring 'em in? Exclusive selling features? A tested selling slogan? Striking display and promotion helps? Local newspaper advertising?

Check your own answers . . . and then give this Westinghouse 1939 Fan-Selling Program a thorough going over. It's complete . . . powerful . . . practical. It gives you *every* sales-building advantage listed above. It's on the way to you *now*, in the hands of your Westinghouse distributor salesman. Or write direct to Westinghouse Electric & Manufacturing Co., Dept. 9014, Mansfield, Ohio.

Don't miss seeing the most COMPLETE fan selling program in the industry, and the COMPLETE fan line for '39. You can't afford to . . . if you're interested in bigger fan profits this year!

Westinghouse Long-Life Fans

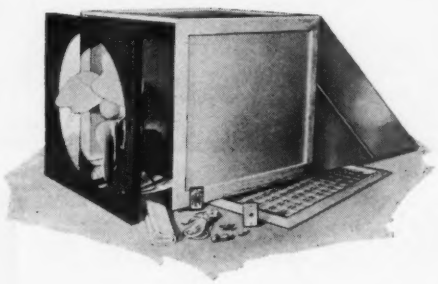
"The Line of Least Resistance"



Get *Your* Share of this profitable Summer Home Cooling Business

● When Spring sales curves of electrical appliances start on the down-grade, VIKING can come to your rescue with its fast-selling line of streamlined attic fans. The VIKING is not "just another" fan thrown together to sell at a price. It is expertly engineered for greatest efficiency, with many new and exclusive improvements. Backed by VIKING'S reputation and supported by powerful sales-producing promotion material for dealers, it will build a new profit peak for you, just when you need it most.

VIKING AIR CONDITIONING CORPORATION
Main & Center Streets • Cleveland, Ohio



VIKING *Sets New Standards*

VIKING has always led the field. Since its founding it has maintained a policy of steady, progressive development. Through its engineering and research laboratories many new developments have been designed and introduced first on Viking equipment, which have now become standard application throughout the industry. *These advantages are offered to you. Viking leadership can also mean leadership for you in your community.*

Write today for Complete Information, showing how you can make the most of this profitable summer "home-cooling" business.

VIKING AIR CONDITIONING CORPORATION

Take a Look!

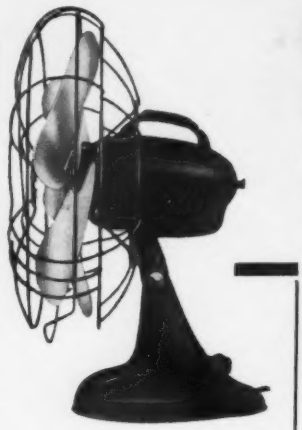
HERE ARE THE FACTS ABOUT FAN PROFITS!

Don't commit yourself to any line of fans for 1939 until you have seen the new G-E BRASS TACKS Fan Portfolio! It's crammed with facts about fan profits that make mighty interesting and helpful reading!

The salesman of your local General Electric Fan Distributor will be around shortly to show you his copy of this unique portfolio. Watch for him—listen to him—and profit by his sound advice!

GENERAL ELECTRIC

As Modern as TOMORROW



This streamlined beauty is the new Deluxe 16-inch SIGNAL 3-speed Fan. It is modern in styling and engineering. Some of the outstanding features are enclosed oscillating unit with push button control, slow speed motor, greater air delivery, wide sweeping fan blades and unusual quietness.

$29.50 LIST

Finished in rich black baked-on enamel, polished aluminum blades and cadmium plated guard.

SIGNAL ELECTRIC MFG. CO.
MENOMINEE, MICH.

SIGNAL

Offices in all principal cities

RUBBER BLADED SAFE-FLEX SKY-ROCKETS TO NEW HIGHS!

A sensation when introduced . . . Safe-flex sales have sky-rocketed year-after-year. And Safe-flex will unquestionably zoom to a new high this year. Because America now knows the priceless safety and silence of Safe-Flex rubber blades!

SMART NEW SPUN-GLOW CHROME NOSEPIECE is only one of the sensational improvements in design and construction that makes Samson Safe-flex your 1939 best bet. With new beauty and new standards of performance available, more and more customers will insist on Safe-flex. They just won't buy metal bladed fans. No wide awake dealer will pass up this profitable business!

SAMSON Safe-flex the original
RUBBER BLADED ELECTRIC FAN

Copyright 1939, SAMSON-UNITED CORPORATION, ROCHESTER, N. Y.

FATTEN YOUR WINTER PROFITS by selling Coolair fans to new home builders. Every fan is guaranteed—no trouble calls to plague you.

AMERICAN COOLAIR COR PORATION
Jacksonville, Fla.

CHROMALOX SUPER-SPEED RANGE UNITS

They make any range look better and cook better —

That's why you find them on so many up-to-the-minute ranges. Great for replacement, too — they fit all ranges.

ATLANTA, Ga.—C. B. Rogers, 1000 Peachtree St. DALLAS, Texas—Elgin B. Robertson, 1215 N. Zangs Blvd. RALEIGH, N. C.—W. R. Phillips. OKLAHOMA CITY, Okla.—Paul Berry, 3128 N. W. 26th St.

EDWIN L. WIEGAND CO., 7600 Thomas Blvd., Pittsburgh, Pa

CERTIFIED RATINGS SELL ATTIC VENTILATION

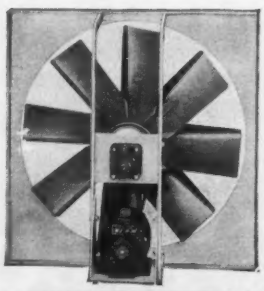
Investigate Certified

COOLVENT SYSTEM

* Why gamble on your sales or installations? Make definite surveys and determine the total cubic feet of air per minute needed to give the number of air changes required.

* SELL C.F.M. NOT FAN SIZES. Send now for Coolvent Bulletin and Prices. All AUTOVENT ventilating equipment including the COOLVENT ATTIC FAN is tested and rated in accordance with standard test code as adopted jointly by National Association of Fan Mfgrs. and American Society of Heating & Ventilating Engineers.

AUTOVENT FAN & BLOWER CO.
1825-27 N. Kostner Ave. Chicago, Ill.
Members National Ass'n. of Fan Mfgrs.



Insist on CERTIFIED RATINGS Install AUTOVENT Ventilation

C. B. ROGERS

ELECTRICAL HEATING ENGINEER
CHROMALOX
ELECTRICAL HEATING UNITS
and
CHROMALOX
EQUIPPED PRODUCTS

1000 PEACHTREE STREET
ATLANTA, GEORGIA

WHAT DO YOU KNOW ABOUT THOSE NEW DIEHL "JUNIOR" FANS?
WHAT IS THE STORY ABOUT DIEHL AIR CIRCULATORS?
WHAT IS NEW IN DIEHL ATTIC VENTILATION?
CAN YOU GIVE ME THE FACTS ON THE ENTIRE DIEHL FAN LINE?

YOU'LL FIND THE ANSWERS IN THE 1939 *Diehl Fan Catalog*

This new DIEHL Fan Catalog, illustrated with large realistic fan pictures and pages of selling specifications, points the way to outstanding profit opportunities. In this complete DIEHL Fan Line there are available smart looking, efficient and reasonably priced DIEHL Fans for almost all types of application . . . fans that are built to create lasting good-will and satisfaction . . . fans that offer unprecedented opportunities for increased sales volume.

Added to this, is a series of colorful attention-getting dealer selling helps to attract buyers—to help make sales with profits for DIEHL Fan Dealers. Return the coupon today for your copy of the DIEHL Fan Catalog or ask your wholesaler for full information and prices on the DIEHL 1939 Fan Line.

DIEHL MANUFACTURING COMPANY
Electrical Division of
THE SINGER MANUFACTURING COMPANY
Elizabethport, N. J.
Atlanta Boston Chicago Dallas New York Philadelphia

1939 DIEHL FAN CATALOG
Get your copy today!
See the modern up-to-the-minute fan models with complete specifications. See for yourself how completely the DIEHL Line provides the features sought by fan buyers everywhere!

FILL IN—TEAR OUT
(Pin it to your Company letterhead)
Diehl Mfg. Co.,
Elizabethport, N. J.
Send me a copy of the 1939 Diehl Fan Catalog:
Company _____
Street _____ State _____
City _____ Title _____
Signed _____
MAIL COUPON TODAY

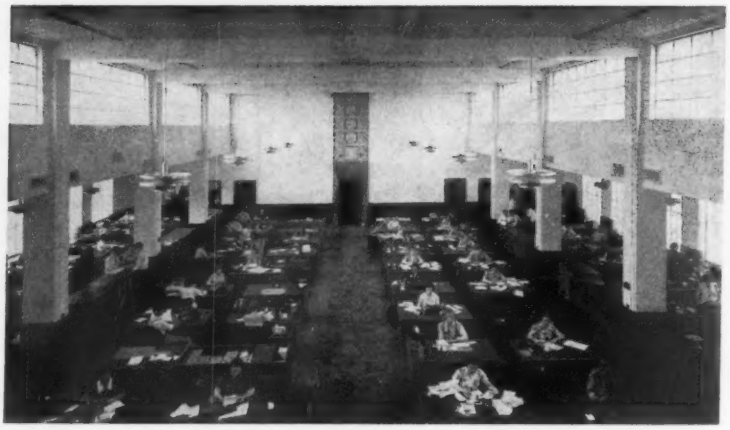
FIFTY YEARS OF LEADERSHIP IN FAN DESIGN AND MANUFACTURE
— — — A Size and Type for Every Need — — —

Direct-Indirect Lighting Employed Advantageously

AMONG the first questions asked by visitors who arrive in Wheeling, West Virginia, after dark is "what building is that over there with the spot light on it?" The question is a natural one, for the new home office building of the Fidelity Investment Association stands out brilliantly illuminated by eighteen separate flood lights. Each of the flood lights is carefully placed so as to set off to the best possible advantage the three stories and central tower of the building.

Illumination has been given careful consideration inside the Fidelity building, too. Workers enjoy the very latest developments in direct, indirect, semi-direct and direct-indirect lighting. Two hundred and ninety-three individual planned lighting fixtures were installed.

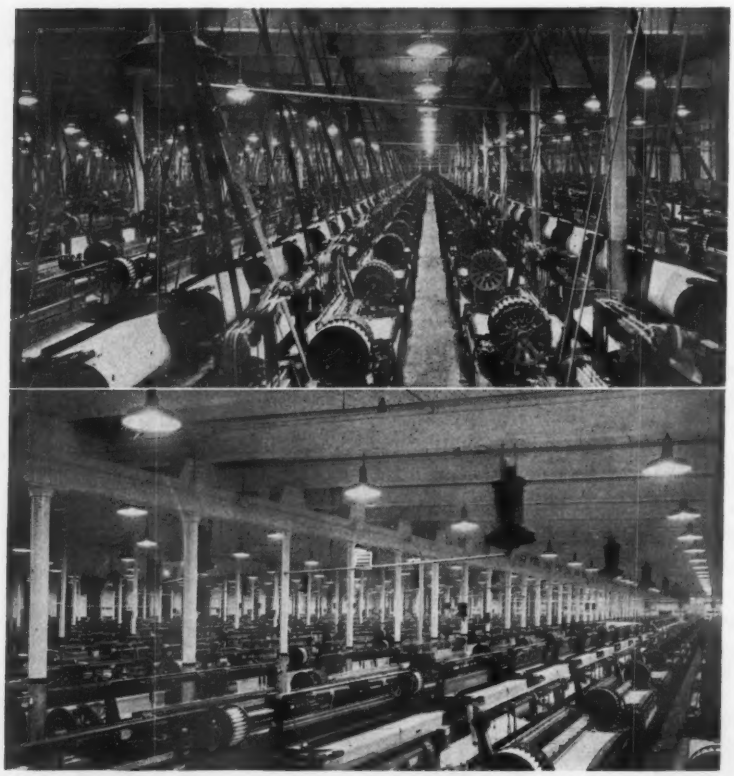
The method in which direct-indirect light is employed in the 84 ft. x 69 ft. main accounting room is especially interesting. Here the general illumination is provided by indirect light and a proper balance of direct light facilitates close work. This is accomplished by using an aluminum cap that fits around the lamp and varies the amount of the up and down light and by using a bottom plate of Luxilite glass for the proper diffusing of light over the working area. This type of fixture provides any quantity of illumination by using 500, 1,000 or 1,500 watt lamps and will give from 50 to 75 footcandles as the work may require.



Combination direct-indirect fixtures were used advantageously to light this high-ceiling office of Fidelity Investment Association. . . .

Over eight and one-half miles of electric wire was used in wiring the new Fidelity building. The current used when all electrical equipment is in operation amounts to 102,300 watts. The building has 320 light outlets, 300 base receptacles and 200 wall switches.

The Gee Electrical Company of Wheeling, distributor, supplied the fixtures.



A systematic program of lighting modernization has given the plants of Springs Cotton Mills an unusually effective illumination system. At top is their broadcloth weave room in Kershaw, S. C., and below, weave room in Plant No. 1, in Fort Mill, S. C. . . . . .

Systematic Modernization Of Mill Lighting . . . .

NOTWITHSTANDING the many fine lighting installations found in the textile industry, the majority of plants still are harboring poor lighting. The Springs Cotton Mills, operating several mills in South Carolina are an exception. In these mills a systematic program of modernizing lighting as well as other equipment has been followed.

An example of the improvement in lighting conditions in one of these mills is illustrated in the accompanying photograph of the Fort Mill, S. C., plant. Previous to relighting, drop cords equipped with 150-watt lamps were used, providing an uneven illumination averaging approximately 5 footcandles. The new lighting system

(*Continued on page* 66)

Merchandising

IN THIS SECTION:
Do Washaterias Affect Washing Machine Sales
Planning a Window Display to Sell
Broadcast Facilities in Demonstration Trailer

First National Washer And Ironer Show . .

PREPARING for retail sales of 2,000,000 home laundering appliances in 1939, the manufacturers of the industry will stage their First National Washer and Ironer Show at the Stevens Hotel, Chicago, January 8 to 14.

More than twenty members of the American Washer and Ironer Manufacturers' Association will participate and more than 5,000 buyers from throughout the United States and Canada are expected to attend.

"It will be the greatest home laundering equipment show ever staged," said J. R. Bohnen, executive secretary of the Association. "New washers and ironers will be shown, with new styling and convenience features. The industry has been concentrating on its show plans for months.

"Buyers within the duration of this show will be able to obtain complete first-hand information on a whole cross-section of the industry as compared to the insufficient knowledge of a few lines, demonstrated to them by photographs and catalog pictures, they will receive if they stay at home waiting for salesmen to call on them. They will use their time to still greater efficiency by being able to see a wide range of new models in both washers and ironers assembled at one spot, the immense Stevens Exhibit Hall."

Named by W. Neal Gallagher, of Newton, Iowa, president of the Association, as a special committee on arrangements for the Show are John M. Wicht of the General Electric Company, Bridgeport, Conn., L. L. Shawber of Westinghouse Electric & Manufacturing Co., Mansfield, Ohio, and A. H. Labisky of the Barton Corporation, West Bend, Wis.

"The members of the American Washer and Ironer Manufacturers' Association at their semi-annual meeting in Chicago on June 15 voted to inaugurate what they plan to be an annual event by holding an exhibit of their merchandise at the Stevens Hotel," said President Gallagher.

"It is hoped by the members of our Association that this decision on their part will be welcomed by the appliance buyers of America in that it will enable them to see the new and improved models of many manufacturers.

"Members of the American Washer and Ironer Manufacturers' Association plan to publicize the Show both collectively and individually and by their efforts feel certain that they can attract several thousand buyers of major appliances during this particular market season."

EHFA Issues New Schedule For Appliance Sales . . .

A REVISED schedule of minimum down payments and maximum terms on appliances elegible for financing by Electric Home and Farm Authority was issued November 16, 1938. As announced previously, conversion oil burners and coal stokers have been included in the list of appliances eligible for financing. This equipment is shown in the group of appliances which, for individual sales, may be financed over a maximum period of 36 months with a minimum down payment of 5% of the cash installed price.

In addition, the revised schedule includes a revision in the terms available on radios. Beginning January 1, 1939, any contract covering the sale of a radio only will be accepted for financing over a period not exceeding 12 months. This applies only to radios sold individually.

New Appliance Models Go on Display . . .

CONCENTRATED effort on the part of more than 160 major home appliance exhibitors and the American Furniture Mart to make the winter national home furnishings show to be held January 9 to 21 the most complete and finest ever held was substantiated by announcements from exhibitors that they would show complete new lines in model settings tying in with new merchandising plans by the Mart, which include window displays, planning bureaus, model kitchens and laundries and actual consumer - type demonstrations which the dealer may perform on the retail floor.

Presenting one of the largest and most comprehensive displays of major home appliances ever concentrated under one roof, the show will lead off with a brilliant debut of the 1939 models of all types of major appliances, including complete lines of stoves, ranges, heaters, washers, ironers, refrigerators and small home appliances, in addition to cabinets, sinks, wall installations and furnishings. Never before, according to market officials, has such a complete showing of major home appliances been teamed with other home furnishings, permitting the dealer to fill all of his requirements from selections offered by more than 850 manufacturers.

Neatest trick of the show is expected to be the newly revised Kitchen Klinic, first inaugurated in July, 1938, and now expanded to include a complete planning bureau, which the dealer may convert into use on his retail floor. In addition, the model kitchens and laundries will be redecorated and refurnished with settings that may be reproduced by the dealer in his windows or on the floor.

One survey indicates that more than 800 "washaterias" are in operation in Texas, alone, ranging from single machine installations to the $7,000 plant shown above recently completed in Fort Worth. . .

Do Washaterias Affect Washing Machine Sales?

By Elbert Haling

AS one Texan aptly put it "The washateria is washing the Lone Star State!" This new industry is spreading like wild-fire through hamlet and metropolis. One can scarcely drive through a single residential section of a Texas city without finding at least one sign on a doorfront with a message of this kind: "Washateria—Come in and Bring Your Dirty Clothes. Wash Them Yourself in An Electric Washer At 35c An Hour. Pocket the Difference!"

The Texas washaterias range in size and importance from the small residential washateria running two electric washers almost night and day to the recently opened Elmwood Washateria in Fort Worth, which keeps 15 machines going constantly and cost to owner $7,000 to construct.

With all this activity springing from the old fashioned wash tub and a bar of laundry soap, this correspondent decided to conduct an investigation of his own just to see what there might be in the washateria movement for the electrical industry. Since one of the best ways to get the facts on any business is to visit its competitor, we called on one of Texas' leading laundries located in Dallas.

"Yes," said the laundryman, "we consider the washateria movement a danger to a portion of our regular customers—usually those in somewhat uncertain economic circumstances. We have even felt the boat rocking a bit but we feel that when our lost customers regain their economic footing, they'll return to us better clients than ever before!"

Valuable to Dealers

But what about the electric dealer—the man with washers and ironers to sell—the washer distributor himself? How do they feel about this new industry? Will it hurt sales or result in a new outlet for their products?

T. C. Jones, 812 Main Street, Fort Worth, and one of the best known electrical dealers in the Southwest, was only too glad to discuss the washateria and its opportunities. Mr. Jones had evidently considered the matter before.

"The washateria rush should be of positive sales value to many electrical dealers. We have already sold washers to several washateria installations.

"We find these installations not only a source of business but good advertising. In many instances the washateria patron gets to see her first electric washer actually in operation. Many of these women hove turned down our washer salesmen's offers to give a home demonstration of an electric washer heretofore. We now have definite proof of washer sales to former washateria patrons. In scattered cases, we've managed to follow up with an ironer deal—all as a result of the washateria activity," Mr. Jones concluded.

Distributor's Viewpoint

Who should know more about the washateria movement than an electric washer distributor? Roy D. Heath, personable regional southwest manager for the Maytag Company, was interviewed in the spacious display room of the Generator Service Company, Fort Worth, where a full washer line is

(*Continued on page* 32)

Do Your Windows Sell?

A dealer would discharge a salesman who doesn't produce but his display problem is not so easily solved.

WHAT should the dealer seek in window displays? How can he dress his window for maximum effect? Should he keep a display pattern and allow nothing to deter him from following it, or should he plan each display separately?

Curiosity of the public should be the first objective.

The Mississippi Power and Light Company recently provoked a number of sales above the average in its appliance department by a unique display in the window of its Jackson office in which an old style ironing board, flat iron and stove were pictured behind bars with a placard, "Inconvenience Imprisoned." Outside were modern appliances.

This exhibit was successful largely because the public was stopped by its unique appeal, then made to think, "Am I deliberately inconveniencing myself?"

The same appeal sold a multitude of appliances for an Amarillo, Texas, firm. It directed an appeal to husbands. In its window, it displayed an old fashioned rub board, tub and flat iron. Posted above was a sign reading: "Mr. Husband! Is Your Wife a Slave to These? Emancipate Her! Inquire about our easy pay plan."

The exhibit attracted widespread attention and people actually went out of their way to see it. The sign touched man's vanity, his most vulnerable spot. The appliance dealer capitalized on the combination when he boomed his sales.

Curiosity will bring the public to look at a display. The first objective of a good advertisement, to be seen, is thus accomplished. But the work of the display is only started there. It must combine an appeal to buy with its appeal to look. The two displays outlined above did that.

A display can easily be attractive but have no sales appeal.

Contrasts Always Effective

Contrasts between the old and the new always have both if the appliance dealer devises a way to ask a question. The simplest way is a sign, as used by the two concerns above, but an ingenius dealer can find other methods.

An El Paso appliance dealer advertised that he was putting an equal amount of food in a new electric refrigerator and in an old style ice refrigerator. He invited the public to watch the changes in the food. He drew charts showing how rapidly the food in the old box became unfit for human consumption; how the operating cost of the box swiftly passed the electric refrigerator.

These expense charts were carried to their ultimate conclusion by showing that the electric refrigerator would pay for itself in savings. Capping that were the obvious arguments, mutely presented by the refrigerator, of beauty, convenience, ultility. There was the time payment plan that finished the wavering objections of the customer.

Displays such as these are designed primarily to introduce a new product and to move it swiftly, although they will serve for a considerable time without change. Then the dealer must move something else into the window.

For the sake of variety, to prevent the slump in sales of other appliances, he should introduce a very conservative display, slanted at beauty, not at convenience. Perhaps it is best not to show any old or inconvenient model in comparison at first. The public becomes saturated with that after awhile. When women begin to admire the beauty of an article, the dealer can help them in their arguments with their husbands by some "economy" display.

This type of procedure will work even without great advertising in the accepted mediums, such as the newspaper and radio, but ordinarily, of course, the dealer must engage in plugging a product in connection with manufacturer advertising. After exhausting his repetoire of fetching ideas, he will do well to promote one or

A successful window display must not only attract the passerby but must have sales appeal as well if it is to bring in prospects . . . .

HOTPOINT

NEW RANGES NEW FEATURES NEW PLAN

CALROD TARGETS THE HEAT

CALROD'S HEAT GOES QUICKLY AND ACCURATELY DIRECT TO THE HEART OF YOUR COOKING JOB.

NO HEAT IS WASTED AROUND THE SIDES OF UTENSILS. THERE IS NO FLAME. CALROD HEAT IS CONDUCTED HEAT.

TURN TO ANY OF 5 ACCURATELY CONTROLLED HEATS FROM HIGH SPEED TO LOW-WARM. (SIMMER)

Hotpoint offers the merchandise and sales plans to help you make 1939 a headline year. New range models, priced to win sales from value-wise buyers, will help you cash in on the big popular swing to electric cookery.

In the past 5 years the sales of electric ranges have quadrupled twice. And those "in the know" predict another big year in 1939.

Swing ahead with Hotpoint — the Headline for '39. Get in touch with your Hotpoint distributor today. See the beautiful new range models. Look over the attractive new sales features: 5-Speed Select-A-Heat Calrod. Directional Heat Oven with 5-Heat Switch and Duo-Speed Broiler.

THE SALISBURY—Hotpoint's style and value headliner for 1939. Three 5-Speed Select-A-Heat Calrod units. Directional Heat Oven with 5-Heat switch and Duo-Speed Broiler. Venetia-Lite with Timer Clock and Condiment Set. All Porcelain Enamel, Stain Resistant top.

THE METROPOLITAN—A popular-priced winner, 36 inches wide for minimum space requirements. Full cooking capacity. Big oversize oven that roasts and bakes wonderfully. Hotpoint quality throughout. Cabinet base model. Modern styling. Low price to help create store traffic.

1939 Hotpoint

REFRIGERATORS WASHERS AND IRONERS

ANNOUNCES

HEADLINERS FOR 1939

SWING AHEAD WITH HOTPOINT — THE HEADLINE FOR '39

Everything to help you sell. Put this sales energy to work getting business and making money for you:

New Models • New Features
National Advertising
Cooperative local newspaper advertising
Window Displays • Store Displays
Cooperative Outdoor Postings
Direct Mail • Outdoor Signs
Store Signs
Retail Sales Training
Retail Salesmen's Equipment
Redmen's Club
Slide Sound Films
Home Service Assistance

THE MARK OF A DEPENDABLE DEALER

EDISON GENERAL ELECTRIC APPLIANCE CO., Inc.
5614 West Taylor Street, Chicago, Illinois

Hotpoint's 1939 line of ranges mark the 35th Anniversary of Hotpoint value-leadership. The kind of value that makes your buyers say, "I want that!"

Coming

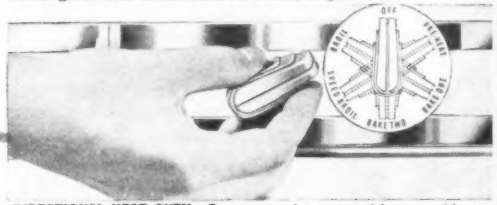
Another big Modern Kitchen Bureau Electric Range Selling Campaign

April 1 to June 1

including new, hard-hitting national advertising, magazine and newspaper publicity. New sales promotion plans and materials.

Watch for announcement of M. K. B. "GUESS AGAIN" Campaign

DUO-SPEED BROILER—Choice of full Hi-Speed for charcoal type broiling or lower temperature broiling heat for barbecuing, toasting, and broiling well-done meats. Ideal for steaks, chops and fowl.



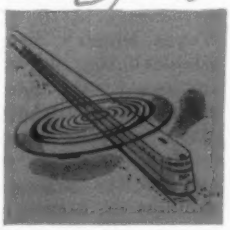
DIRECTIONAL HEAT OVEN—Large, oversize oven, with top and bottom heat controlled by one switch. Gives choice of methods. Improves baking and roasting results. A great sales feature.

WHOLE-MEAL THRIFT COOKER—Six quart capacity. Cooks complete dinner at one time. Operates on minimum of electricity.

1 MODERN *Beauty*

...kling style and streamlined ...y provides eye-appeal that ...the enthusiasm of prospects ...you can turn into sales.

2 UNSURPASSED *Speed*



Hotpoint's 5-Speed Select-A-Heat Calrod gives a fast cooking speed that you can demonstrate to convince skeptics.

3 GREATER *Economy*

Select-A-Heat Calrod, Directional Heat Oven and Thrift Cooker all contribute to low operating cost of the range.

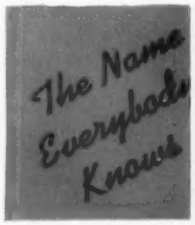
4 PROVED *Durability*

Besides Calrod's remarkable durability the entire Hotpoint range is built for trouble-free service and owner reports prove it.

5 AMAZING *Record*

More than 99.99/100% of the millions of Inconel Calrod glass-sealed coils now at work in homes have given unfailing service.

6 Hotpoint



30 years of national advertising and a generation of ... factory customer service ... which to build your busin...

Electric Ranges 1939

...WATER HEATERS ... SINKS AND DISHWASHERS

two items steadily in his windows with only enough change to prevent monotony and insure investigation by shoppers.

Large appliances, such as radios and refrigerators, must be plugged to be sold. The dealer must keep them before the public at all times, and make them conscious of the desirability of the items.

The dealer can display a single radio, insuring maximum beauty appeal, a radio and a refrigerator, conveying a modernize appeal, and mix up his displays, over a period of time, giving character to his store. The single display idea is the biggest sales promoter of the lot, but it can be overworked like everything else.

The ingenius, curiosity-thought provoking, display should not be used when price slashing sales are given. Price-slashing to move old models is a buying incentive for those who cannot afford new model prices. The price reduction in itself is an incentive. No more is needed or should be used.

There are many dealers who plan their program of displays for months ahead, following a regular scheme, and seldom deviating from it. This idea has its advantages. The dealer will not ignore his display or forget it in the rush of business. He will not allow it to become a mere space, to be filled and forgotten. He becomes window conscious.

The disadvantages of the plan are: the dealer should be prepared to take advantage of manufacturers' advertising, local festivities, national holidays, and other affairs with timely displays capitalizing on the publicity already given the occasion.

A good suggestion is for the dealer to devote a certain amount of time each day to thinking of his displays and planning ahead.

Stores in the urban regions have a different problem from stores in small towns. The urban stores are concerned with two factors, stimulating business, and obtaining a lion's share of it. The small town store is mostly concerned with stimulation. It is not faced, usually, with keen and alert competition of the kind that confronts the city dealer.

Too frequently, this condition dulls the sales promotion effort of the small town dealer. His displays become wooden; his sales arguments listless. He begins to believe that what business there is will come his way anyway and therefore he need do nothing about it.

He should, instead, capitalize on the expanding lines of the REA in his exhibits. The farmer is interested in recreational devices and will probably buy them whether they are exhibited or not if he has the money and the dealer takes the pains to let him know about his product. But the dealer should exhibit items which the farmer might need, yet has no particular desire to buy, through stimulating his interest with displays. On Saturdays, when most farmers come to town, and in appropriate seasons electric milkers, corn huskers, churns, skimmers, and other equipment can be displayed. If the dealer can, he should have the articles in opperation.

He can sell corn huskers by showing just how much corn the average individual can shell in a day and a comparative pile showing how much more work the machine will do. His salesmen should be ready with suggestions on how the labor of the person who did the shelling can be employed so the farmer will not suffer from a diminished income by purchasing the apparatus.

The curiosity stimulant should be worked to its limit by the small town dealer. Rural psychology will show him that the farmer must have a strong urge to come and look at a display when he is in town on Saturday. If the display is sufficiently unusual, he will inspect it, even with no desire to buy. Yet when he returns home he will tell his neighbors about it, and the word will spread.

The dealer, rural or metropolitan, should no more neglect his display than he should neglect the efficiency of his salesmen. He would discharge a salesman who does not produce. The window display is his most important salesman, but if it fails, he must keep it. The only thing to do is to make it successful.

Do Washaterias Affect Washing Machine Sales?

(*Continued from page* 28)

carried. Mr. Heath commented:

"The mushroom development of the washateria is indeed unusual. There are many new angles to the situation of interest to washer salesmen and electrical dealers. We wouldn't go on record as endorsing the washateria but we have found that, in many cases, the washateria has introduced our machine and its workmanship to potential washer customers.

"The first washateria in the country was probably one opened in the town of Vernon, Texas, in 1931. An ex-service man needed a job badly. The washateria idea was suggested to him by an enterprising electrical dealer who let the ambitious washateria owner have four washers on credit.

"Our surveys show that there are approximately 800 washaterias in operation in Texas today. These range in size from two washers to the $7,000 new Fort Worth installation. Strange to say, some of the smaller towns have a surprisingly large number of washateria establishments. Whereas Fort Worth, of 175,000 population, has about 100 washaterias, and Dallas, with 300,000 people, has about 250, Memphis, Texas, with a population of 3,500, has 35 washaterias in action and many other small cities are almost in equal proportion."

This gives rise to what sales arguments are useful in selling an electric washer to a washateria patron who has already been introduced to the utility of such appliances but still feels that she needn't purchase one.

Good sales arguments are: cleanliness of the home as compared with the washateria; inconvenience of bundling the family laundry and walking or driving some distance to the nearest washateria only to endure a lengthy wait for a vacant machine; and economical purchase plans on electric washers and their operation economy.

Two Houston electrical contractors interviewed pointed out that they had each wired nearly a dozen washaterias in the past year.

A Texas Electric Service official admitted that the washateria impetus would least harm the electric utility. In fact, their recently launched "Don't Be a Slave to Save" fits right in with other sales points for selling the electric washer—to homes or washaterias!

Electrical dealer floor salesmen can do well to check up on that next customer request to "see a washer." The prospect may be installing a washateria and it isn't everyday that a salesmaan can sell a dozen washers!

Demonstration Trailer Includes Broadcasting Facilities

IN order to further interest in the modern electrical kitchen and to create goodwill throughout its territory, the West Texas Utilities Company, Abilene, Texas, uses an all-electric trailer for demonstrations daily.

The trailer is 27 feet long and eight feet wide, contains an all-electrical kitchen 8 x 10 feet in size, and a complete broadcasting studio. It has both public address system and facilities for remote control for radio broadcasting purposes.

Within a year more than 200,000 people have visited the trailer and examined the model kitchen.

With headquarters in Abilene, the trailer and its crew constantly travels over the company's territory, making all county fairs, cooking schools and other special events which offer an opportunity to demonstrate the kitchen to groups.

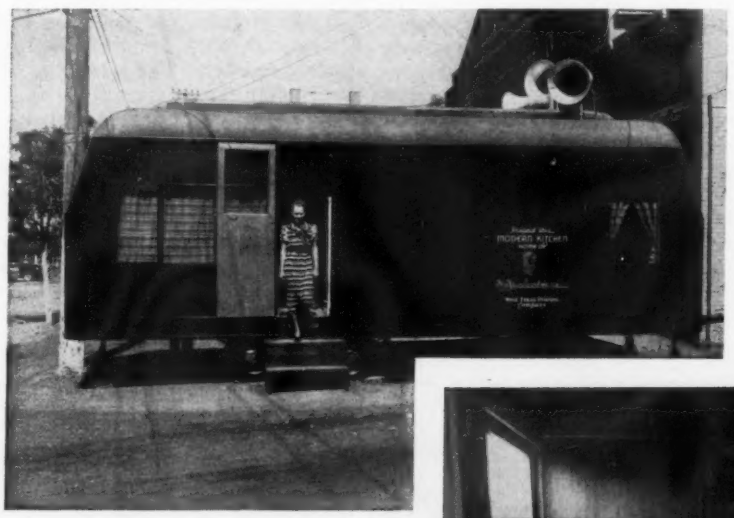
The company, through its local office, contacts fair officials or others in charge of special local events and offers them the facilities of the broadcasting department for their use. The use of the studio attracts crowds for the broadcasts, and then those in charge of the exhibits are on hand to invite spectators through the trailer for an inspection of the kitchen and other electrical appliances.

When the trailer is in a town for any appreciable time, those in charge invite amateur entertainers to appear in the broadcasting studios where their acts are broadcast through the public address system.

Among the appliances contained in the trailer are an electric range, refrigerator, dishwasher, air-conditioner and hot-water heater.

"We make little effort to obtain direct prospects from the demonstrator", points out Gene Elo, advertising director of the company, "but it is a real factor in appraising people of the many electrical appliances for the modern home, and the good will and interest it creates produces many inquiries for our local branches."

The trailer is designed to appeal to the average owner of a modern home, rather than owners of the high-priced homes of the section.



Provided with a complete broadcasting studio and public address system in addition to the all-electric kitchen, this demonstration trailer is used to advantage by West Texas Utilities Company. . . . . .

Washer Rental Promotion Helps Sales Indirectly . .

FOR the dealer in washing machines whose community has a high percentage of apartment house dwellers, the promotion of rental washing machines promises long run benefits, as well as immediate sales. This is the report of H. C. Becker, Tulsa, Oklahoma, appliance dealer, on his efforts in this direction.

The Tulsa dealer doesn't handle the washing machine rental directly, but encourages certain customers to establish rental enterprises as businesses in themselves. Each of these means the sale of approximately 25 or 30 washing machines. But more than this, while the appliance dealer makes no effort to follow up on rentals with real sales

effort, it means that rental users become "habituated" to the particular line of machine promoted by this dealer.

"Tulsa, particularly, is an apartment house town," Mr. Becker pointed out. "People living in apartments are often cramped for space. They don't mind having the kitchen cluttered up during the day, but they seldom have room for a machine of their own. Basements are small, and some apartment houses have no basements at all; to own a washing machine outright presents a storage problem.

"This is the reason why the rental business has worked so well. The apartment housewife can order her machine delivered in the morning and have it picked up that night; it is a convenience to her to be able to rent one as needed."

League Association Meeting Well Attended

LEAGUE men and others from all parts of the country attending the Third Annual Conference of the International Association of Electrical Leagues, November 17, 18 and 19 voted it one of the most successful meetings ever held. The meeting took place in the auditorium of the Electrical Association of Philadelphia and the attendance, in addition to the league men, included representatives of manufacturers, utilities, wholesalers and contractors. In all, 130 participated in this Conference.

A most constructive program was presented, covering practically every phase of the industry's interests. It included addresses on lighting, wiring, appliance promotion and merchandising legislation, each of which were dealt with by leaders in the various branches of the industry.

The address of welcome was made by C. K. West, president of the Electrical Association of Philadelphia, and the speakers included: H. P. Liversidge, president, Philadelphia Electric Company; C. A. Eastman, chairman, National Better Light-Better Sight Bureau; S. G. Hibben, lighting specialist, Westinghouse Elec. & Mfg. Co.; W. E. Sprackling, chairman, The Modern Kitchen Bureau; C. M. Ripley, General Electric Company; D. S. Stophlet, appliance division, Westinghouse Electric & Mfg. Co.; Dr. G. W. Allison, Edison Electric Institute and Walter Mitchell, Jr., statistician, Dun & Bradstreet.

Three sessions were devoted to general subjects and three to a discussion of specific activities of leagues.

A feature of the meeting was the election of officers for the year 1939. The new officers are A. A. Gray, manager, Electric Association, Chicago, Ill., president; G. W. Weston, secretary-manager, Electric Association of Kansas City, Mo., vice president; J. S. Bartlett, managing director, Electric Institute of Washington, D. C., treasurer.

The Need for a Better Dealer Program . . .

(*Continued from page* 6)

prospects similar to the recent customer survey of the Arkansas Power & Light Company.

(6) Set up a school for dealers on business management, budgets, financing, advertising, etc.

(7) Set up a school for dealers' salesmen and man it with skilled specialty salesmen, preferably successful dealers' salesmen themselves.

(8) Supply successful practical dealer co-ordinators whose duty would be to analyze the dealers' territory; help the dealer organize his business; show the dealer how to deputize his business details to subordinates and spend as much of his time as possible selling.

(9) Supply dealers with lists of new meter applications and rural extensions promptly.

(10) Supply dealers with dramatized rate charts, also appliance saturation estimates.

Many dealers are excellent salesmen but fritter away much of their time on unproductive details. Show the dealer that after all his only productive time is that spent in the presence of the prospect, selling.

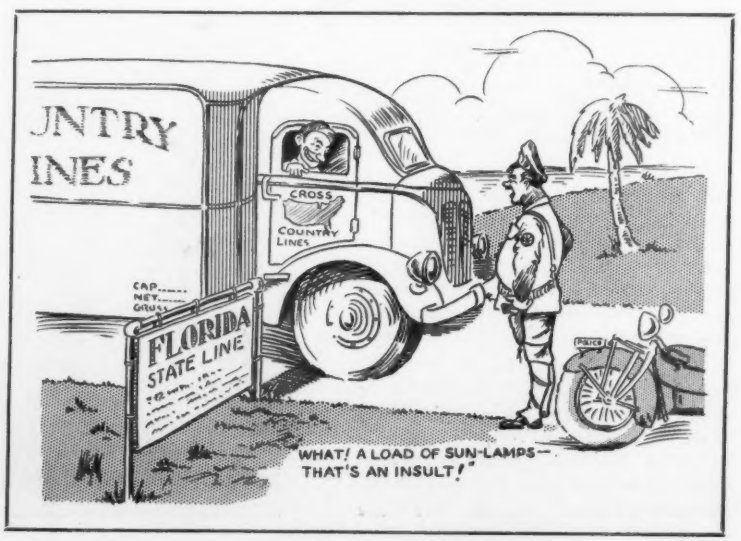
With a program like this to offer a dealer, better dealers would be the result inevitably.

Modern Kitchen Bureau Announces 1939 Plans

Complete details of the 1939 program of The Modern Kitchen Bureau will be off the press about the middle of January, according to a statement by H. L. Martin, manager.

The Bureau's 1939 Plan Book will outline five activities: a year-round all-electric kitchen program, and campaigns for the electric range, electric water heater, electric refrigerator and roaster.

A newcomer in the Modern Kitchen Bureau program is the electric roaster. The backbone of the roaster campaign will be a series of national advertisements, running throughout the year, in McCall's magazine and Women's Home Companion, and during June, July, October, November and December in the Saturday Evening Post. These are designed to turn prospects into buyers during the peak sales period.



Their Follow-Up Calls Keep Sale Closed

By S. W. Ellis

CUSTOMER contacts once a week by salesmen for thirty days after an electric appliance has been sold by the Guthright Sales Company, Pine Bluff, Arkansas, keeps the customer sold and stimulates future sales, reports S. P. Crimmond, manager.

"We consider our plan of personal contact our most valuable business aid," said Mr. Crimond, "At first we used the 'once-a-week salesman contacts' only for large sales, such as refrigerators, washing machines, ironers, ranges and furnaces. It proved so valuable, however, that now our men follow up the smallest appliance sale.

"The first thirty days are the most dangerous when a customer has purchased a refrigerator, range, or other high-priced electric appliance. After the novelty has worn off, it is human nature to hunt for faults even when faults do not exist. Frequently our refrigerator customers, for example, find that they are unable to make good frozen desserts. It's not the fault of the refrigerator, of course. But the customer needs a little encouragement, and it's up to the dealer's salesman to give it. Our salesmen are trained to help the customer with such problems, if she needs coaching.

"We sell washing machines and ironers on the same principle. When a machine is sent to the home for a demonstration, a salesman always goes with it when it is delivered. He does not do the washing, but gives complete instructions and starts the washing, or the ironing. The woman herself is encouraged to do the work.

"While she is operating the machine, the salesman discusses it with her emphasizing its economy and utility. Many of our low-income customers pay for their equipment by doing laundering for friends. We sell these customers on the good business of producing fine laundering with modern home laundry equipment."

This dealer never leaves demonstration washers or ironers in the home for more than 24 hours. If the customer is not completely satisfied with the equipment after trying it herself for one week's laundering, she will never be sold. So 24 hours after the machine has been delivered, the salesman calls again. If a sale is made, the salesman presents himself on the next day, if possible.

"You just can't tell what problems arise between calls during those first thirty days," said Mr. Crimond. "And also look at the four splendid opportunities the salesman has to go right into the home and find out what additional sales may be made!

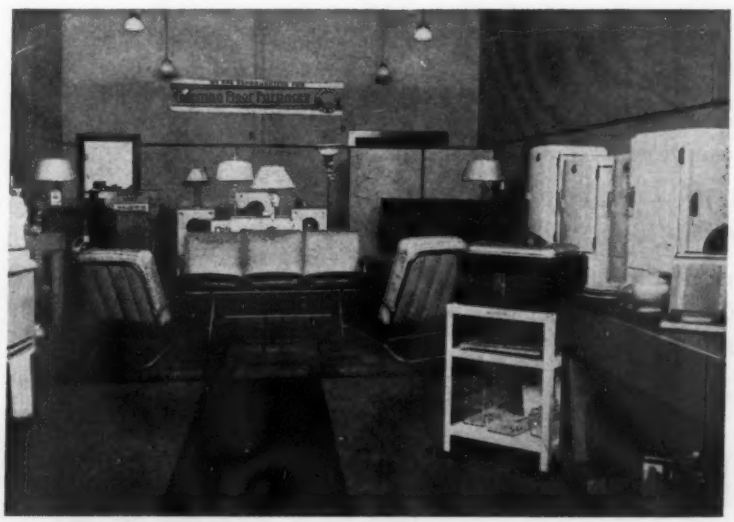
"We sell the entire home appliance line of of one manufacturer. And we endeavor to make our good customers want to own more than one piece of equipment from the line. We're just as glad to sell an electric roaster as a refrigerator. We sell a lot of roasters, too. And we never fail to follow the sales with four call-backs.

"How are those new light bulbs doing, Mrs. Brown?' the salesman can ask pleasantly at the front door. He and Mrs. Brown are no longer strangers. She is a customer of the Guthright Sales Company. And she will lend a friendly ear when the salesman asks, 'How about letting me bring out that indirect-lighting lamp for you to try?' Before many months, she may be a customer for several appliances."

This dealer has a list of every electric meter in town. Several times a year every user is contacted personally by a salesman.

"That means a lot of work for the company," Mr. Crimond acknowledged, "but the method turns up a lot of prospects, too. Every user of power should be a prospect, if it's only for electric bulbs. The wealthier homes aren't our best prospects, either. Recently we sold the highest-priced washing machine in our store, as well as an ironer, to a woman who had to make her own living. She is supporting herself entirely now with this equipment."

Although this dealer considers contact by salesmen at the home very valuable, he does not discount the importance of contact in the store. Accordingly, women are encouraged to drop into the store to meet friends and to rest. An attractive modernistic ensemble of settee and chairs has been arranged in the center of the store for women customers.



Mr. Crimond has one of the most attractive displays in the state.

ARE YOU JUST A

THAT'S NOT THE LEONARD WAY OF DOING BUSINESS

Leonard Dealers are Treated as Individuals, with Problems of Their Own. They Get Help Instead of "High Pressure." They Get Plenty of Territory to Grow in, instead of Being Over-Crowded

YOU'RE NOT in business for your health. No one is.

You are looking for that very useful "net" at the end of the year. But there is more than one way of arriving at this "net." Some of the ways are painful —some pleasant.

Leonard believes that half the headaches in this business aren't necessary . . . that high-pressure selling, over-crowded territories, and over-loading, are chickens that come home to roost.

It seems that a lot of other business men agree with us . . . judging by the list of Leonard distributors shown at the right.

Run your eye down the list. You'll recognize most of them. It reads like the Blue Book of this industry.

They've been in business a long, long time. They know what it's all about.

They know that one dealer, loyal throughout the years, is a bigger asset than half a dozen who pass out of the picture.

They know that dealers must make a profit from the franchise if they are to stay in business.

They know that an electric refrigerator is different from a pack of chewing gum that can be franchised to anyone. They know that dealers need "growing room."

So the process of placing a Leonard dealer franchise isn't one of "shooting tacks at a map." They go slow and easy . . . which results in fewer dealers, but explains why Leonard dealers keep on being Leonard dealers.

We have deliberately not said a word yet about the Leonard line of '39.

The features shown at the right are simply some of the highlights. We would prefer that you see the line yourself and meet the man who stands behind it in your locality.

We bet you're going to like him.

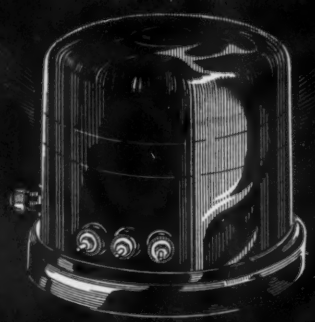
If you believe in individual initiative and freedom of action . . . if you like "elbow room" . . . we believe you'll like the Leonard way of doing business.

At least, why not find out? LEONARD, 14250 Plymouth Road, Detroit, Michigan.

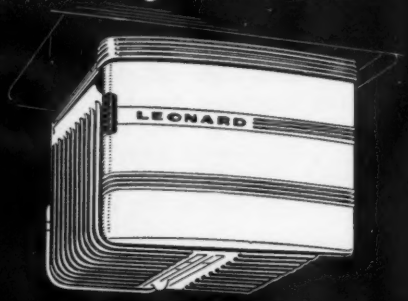
ASK ANY LEONARD DEALER ABOUT THE LEONARD WAY

ATACK ON A MAP?

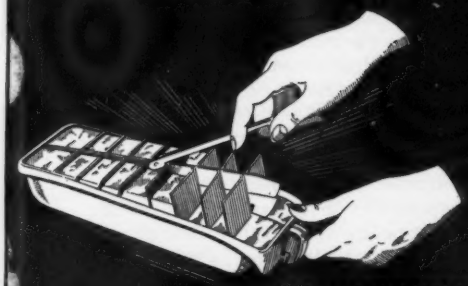
Fast Selling High Spots for 1939!



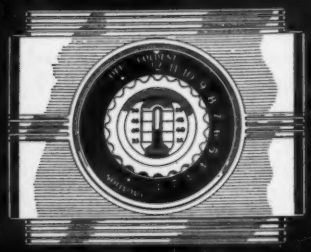
The quiet, sealed unit that gives your salesmen a sales-clinching economy story, and you a new idea of "service freedom".



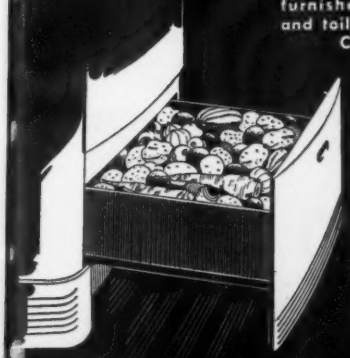
New evaporator does its bit in helping to freeze cubes faster—also provides storage space for "fast-frozen" foods.



All trays in standard models furnished with the time- and tail-saving Ice Popper Cube Release.



...The Master Dial... tunes in the temperature you want inside.



Nearly two bushels of vegetables go into this extra-capacity dry storage bin.

Here's where . . . and how . . . meats and fish are properly kept.

Leonard Travels in Good Company

Albany, N. Y.	E. S. & E. Co., Inc.
Altoona, Pa.	Electric Appliance Distributors
Amarillo, Tex.	Nunn Electric Co.
Atlanta, Ga.	Lamar-Rankin Co.
Binghamton, N. Y.	Broome Distributing Co.
Birmingham, Ala.	Watts-Newsome Co.
Boise, Idaho	Bertram Motor Supply Co.
Boston, Mass.	J. H. Burke Co.
Buffalo, N. Y.	Joseph Strauss Co.
Burlington, Vt.	Vermont Hardware Co.
Charleston, W. Va.	Eskew, Smith & Cannon
Chicago, Ill.	L. C. Wiswell Co.
Cincinnati, Ohio	Schuster Electric Co.
Cleveland, Ohio	Arnold Wholesale Corp.
Columbus, Ohio	Appliance Distributing Co.
Dallas, Texas	Peaslee-Gaulbert Corp.
Dayton, Ohio	York Supply Co.
Decatur, Ill.	Linn & Scruggs
Denver, Colo.	Hendrie & Bolthoff Co.
Des Moines, Iowa	A. A. Schneiderhahn Co.
Detroit, Mich.	Buhl Sons Co.
Dodge City, Kans.	Mullin Furniture Co.
Escanaba, Mich.	Delta Hardware Co.
Grand Rapids, Mich.	J. A. White Distributing Co.
Harrisburg, Pa.	Knerr, Inc.
Indianapolis, Ind.	United Distributing Corp.
Kansas City, Mo.	Federal Distributing Co.
Knoxville, Tenn.	Maytag Appliance Co.
Los Angeles, Cal.	Graybar Electric Co.
Louisville, Ky.	Stratton-Terstegge Co.
Memphis, Tenn.	Harry T. Wilson Co.
Miami, Florida	Major Appliances, Inc.
Milwaukee, Wisc.	Taylor Electric Co.
Montgomery, Ala.	Mathews Furniture Co.
Nashville, Tenn.	McWhorter, Weaver Co.
Newark, N. J.	E. B. Latham Co.
Newburgh, N. Y.	Shapiro Sporting Goods Co.
New Haven, Conn.	H. M. Tower Corp.
New Orleans, La.	Radio Specialty Corp.
New York, N. Y.	E. B. Latham Co.
Oklahoma City, Okla.	Otasco Supply Co.
Omaha, Nebr.	Paramount Radio Shop, Inc.
Paducah, Ky.	Gleaves & Son
Peoria, Ill.	Cohen Furniture Co.
Philadelphia, Pa.	Motor Parts Co.
Phoenix, Ariz.	Graybar Electric Co.
Pittsburgh, Pa.	J. A. Williams Co.
Portland, Maine	Cressey & Allen
Portland, Ore.	Electrical Distributing, Inc.
Providence, R. I.	Ballou, Johnson & Nichols Co.
Richmond, Va.	Graybar Electric Co.
Rochester, N. Y.	Beaucaire, Inc.
St. Louis, Mo.	Electric Lamp & Supply Co.
Salt Lake City, Utah	United Electric Supply Co.
San Francisco, Cal.	Graybar Electric Co.
Scranton, Pa.	Household Appliance Dist.
Seattle, Wash.	Seattle Hardware Co.
South Bend, Ind.	Cloud Bros.
Syracuse, N. Y.	Morris Distributing Co.
Toledo, Ohio	Electric Range & Equip. Co.
Washington, D. C.	Southern Wholesalers, Inc.
Wichita, Kans.	McKelvey's
Williamson, W. Va.	Persinger Supply Co.

★

Y of Doing Business

Attic Ventilation Sales Increase

DEVELOPMENT of attic ventilation in the Houston area has shown steady progress since the first promotional effort, according to records of Herbert E. Dorrill, sales promotion supervisor for Houston Lighting and Power Company. In 1935, he said, there were 46 installations; in 1936, 227 installations; in 1937, 733 installations and, during the first eight months of 1938, 1,633 installations; a total of 2,629.

While the power company's service area includes a number of surrounding counties, the bulk of the business to date has been developed with the Houston dealers. The company's 1938 quota was 1,050 installations.

The company has one man working full time with the dealers to assist them in making estimates and recommendations. On June 1st, an additional man was assigned to the work. The men spent part of their time in calling on builders and architects, selling all electrical services best adapted to the particular job.

Much time was spent in emphasizing better light and adequate wiring, particularly in new homes. The company endeavors to reach the architect, builder, general contractor and home owner while the house plans are still on the drawing boards. This has been one reason why attic ventilation sales have increased so rapidly in Houston.

The company has conducted effective dealer-company campaigns through the staging of electrical shows at the county fairs in the fall and independent shows of their own in the spring.

The spring shows are staged at divisional points, and are scheduled at the time the home service workers, of whom there are 40, will be available. The company leases a store room for a two-day display of all electrical merchandise. On the day preceding the show, notices are circulated throughout the community. The company also pays for newspaper advertising. The crew of men sent by the company puts on entertainment skits in which the merchandise is well plugged. Small attendance prizes such as electric irons are given away and a big prize, a refrigerator or radio for example, is given as a joint dealer-company award. The dealers transport their merchandise to and from the showroom, and in some cases run individual newspaper advertising. The same procedure is followed at county fairs.

These shows draw an attendance of from 500 to 3,500, depending upon the size of the community. An example of their effectiveness was indicated at Goose Creek, a 2,500 meter town, where dealers sold 20 refrigerators right off the floor.

Attic ventilation has been given much publicity at these shows and large quantities of literature distributed which is expected to produce results during the next season.

Display of dealers' fans in the company's show windows is arranged during the peak of the season to further sales, and stories on that subject are supplied Sunday real estate sections of the daily newspapers.

Vacuum Cleaner Industry Optimistic About 1939

THIS country's makers of vacuum cleaners look for marked increase of business in 1939, states Richard J. Simmons, president, Vacuum Cleaner Manufacturers' Association. The saturation factor is steadily diminishing in importance in the sale of vacuum cleaners, and the replacement factor is steadily becoming of greater importance. Some 10 million homes offer a replacement market. Replacement sales are definitely easier than new sales, since willingness to buy is present in every user shown the advantages of new models.

Replacement sales naturally fell behind in the lean years between 1930 and 1937. When conditions improved in 1937, vacuum cleaner sales, stimulated by accumulated demand, passed the record figure of 1929. With slackening of business in 1938 and a return of buying reluctance, the industry sensibly turned to the refinement of its products instead of chasing the will-o'-the-wisp of ruinous prices, inferior merchandise and lower dealer margins. Today the buyer of a cleaner gets more for her dollar than ever before in the industy's history.

Such improvements naturally accentuate the obsolescence factor. To the necessity for replacing wornout cleaners now is added the demand for the current models because of the improved quality of their performance, more attractive styling and greater ease of operation.

The vacuum cleaner industry is conducting a countrywide publicity program designed to show women the advantages of the new cleaners over obsolete models, the importance of buying from reputable representatives of responsible manufacturers and the increasing need for thorough and consistent cleaning in every spot where dirt lurks. The results of this campaign are cumulative and will show more definite benefits in 1939 than in 1938.

Students at Queens-Chicora are assured of better seeing conditions since every room in the dormitories of this girls' college at Charlotte N. C. has been equipped with I.E.S. study and reading lamps.

There are now many colleges in the United States that have dormitory study rooms completely equipped with I.E.S. lamps since this lamp was specially designed for this purpose.

Certainly a study room at a school or college should have good lighting above everything else since it is through the eyes that a student receives most of his education. Poor seeing conditions places a difficult handicap on the student.

Engineering

IN THIS SECTION:
New Steam Plant for Duke Power Company
Giant Converters for Industry
Field Power Factor Tests for Insulation

New Steam Plant Planned By Duke Power Company

THE Duke Power Company will begin work soon on construction of a new 80,000-kilowatt steam plant, to be located somewhere in North Carolina, the exact site as yet unchosen. Construction of the plant, the sixth in the Duke system, is expected to cost around $1,000,000 and to require about two years to build. When completed it will be the second largest in the system, the largest being the 165,000-kilowatt plant at River Bend, on the Catawba River. The "Duck" plant at Spencer is their next largest in the system, with 70,000-kilowatt capacity. Other units in the Duke Power system in the Carolinas are located at University, near Durham, at Mount Holly, and at Duncan, S. C., between Spartanburg and Greenville.

The site for the new plant will not be chosen, according to company officials, until a thorough study of transmission and other problems has been made.

This plant is understood to be the first of several steam plants that will be erected by Duke Power in the next three or four years. A building program involving several million dollars is being launched by the company. Because of the recent dry spell, the company has been forced to augment its water power with steam. The new building program calls for sufficient steam plants to make it independent of water power.

North Carolina Engineers Meet in Durham . . .

THE annual fall meeting of the North Carolina section of the American Institute of Electrical Engineers was held at Duke University December 7 with about 100 electrical engineers from all sections of the state and students in electrical engineering at Duke and N. C. State College attending. Afternoon and night sessions were held.

Principal speaker at the dinner meeting was Everett S. Lee, director of the General Electric Company's general engineering laboratory at Schenectady, N. Y., who gave an illustrated lecture on "The Story of Lightning Measurements." Devices used in measuring lightning were demonstrated by the speaker, who is a representative of the American Institute of Electrical Engineers on the National Research Council.

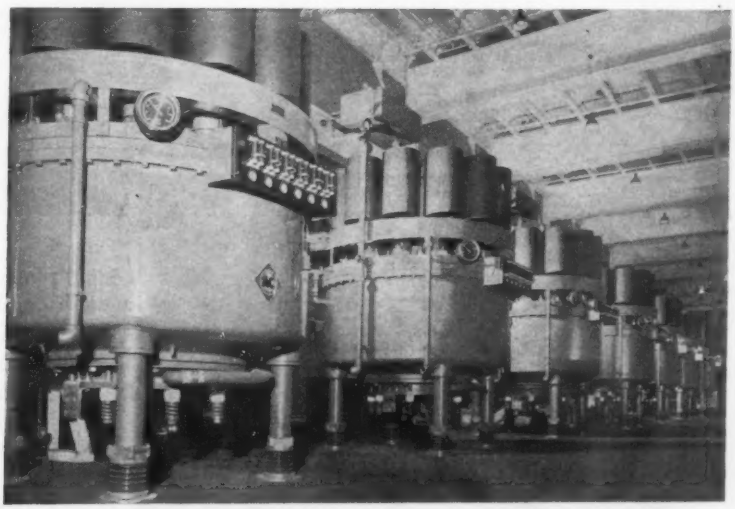
Speakers at the afternoon sessions, which also saw necessary business transacted, were: R. C. Van Sickle, circuit breaker engineer with Westinghouse Electric & Mfg. Co., at East Pittsburgh, Pa., who spoke on "High Voltage Air Circuit Breakers"; John J. Strickland, general superintendent of the Durham Public Service Company, who explained Durham's underground network system; and Christopher R. Webster, Duke University student, who discussed "Safety in Industry".

Marshall E. Lake, of Charlotte, is chairman of the North Carolina section of the Institute, and Earl C. Dameron, of Durham, is secretary.

Giant Power Converters Open New Industrial Field

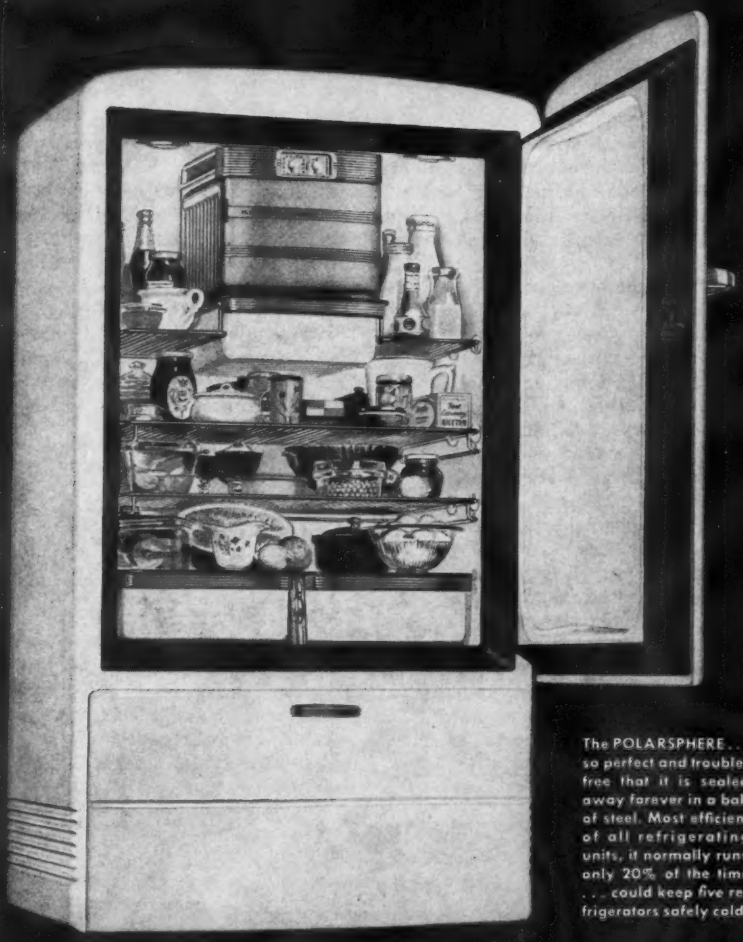
NEW use by American industry of giant power rectifiers —like the rectifier tube in home radio sets, but producing direct current power up to 55 million watts—is indicated by reported success of such apparatus in the Alcoa (Tennessee) Works of the

(*Continued on page* 44)



These ten 5,500-kilowatt grid-controlled rectifier units supply direct current for aluminum reduction at Alcoa Works of the Aluminum Co. of America. It is the largest rectifier installation in the United States and first application for aluminum reduction. . . . . . .

Proudly Presenting the SILVER JUBILEE



New! Glass-top Cold Chest... big enough to hold 14 pounds of meat... keeps it fresh and flavorful for days.

New Location for Thermometer... quick, easy-reading... you know exactly how cold the interior is.

The POLARSPHERE... so perfect and trouble-free that it is sealed away forever in a ball of steel. Most efficient of all refrigerating units, it normally runs only 20% of the time... could keep five refrigerators safely cold.

TODAY YOU'LL SEE 25 years of pioneering and progress!

Here they are . . . twelve beautiful Silver Jubilee models, priced from $118 . . . absolutely new from flat top to streamlined pedestal. Complete price coverage . . . with values that stand out head and shoulders against any kind of competition!

You can talk beauty . . . and we leave it to you if the Silver Jubilee models aren't the most eye-appealing refrigerators ever created.

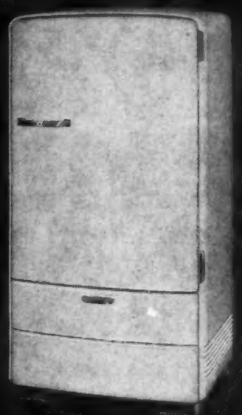
You can talk features . . . and those given

KELVINATOR

New! Vegetable Bin . . . amazingly roomy! Convenient, dry storage. Tilts out. Chromium-type handle.

Cold-making Power equal to 1050 pounds of ice a week! Only Kelvinator has the sensational "Polarsphere".

New, Modern Design . . . Wider front, more storage space . . . ends stretching and fumbling about.



Speedy-Cube Release in trays of Magic Metal. New pull-out tabs—easily free tray from sleeve.

above are just the highlights!

You can talk economy . . . and here's where Kelvinator shines! Get the full story on the new Polarsphere, and see why last year's record-breaking performance is being surpassed for 1939.

Here, in our estimation, is the hottest-selling line that ever graced a salesroom. But don't take our word for it—see your distributor and see for yourself!

KELVINATOR, Division of Nash-Kelvinator Corporation, Detroit, Michigan.

ANOTHER SILVER JUBILEE ANNOUNCEMENT

Vital to Appliance Dealers and Retail Salesmen

KELVINATOR Starts Celebration of 25th Anniversary with Founding of NATIONAL SALESMEN'S INSTITUTE

● You would expect this announcement from Kelvinator—the originator of the "Sales Mean Jobs" crusade that swiftly grew into a nation-wide prosperity movement.

George W. Mason, president of Nash-Kelvinator Corporation, believes the greatest need today is better salesmanship. From that belief comes this statement of H. W. Burritt, vice-president in charge of sales of the Kelvinator Division:

"I am privileged to announce the founding of the Kelvinator National Salesmen's Institute, with Sidney Edlund as its president, and known nationally as sales-manager, author, teacher, and co-founder of the 'Man Marketing Clinic'.

"The Institute bids fair to have an immediate influence on increased earning power for the salesman. Dealers, too, will benefit by solving such problems as securing the best sales manpower, keeping that manpower increasingly productive, reducing employment turnover, and reducing sales expense.

"The Institute courses will be open to any dealer, any salesman handling *any* Kelvinator appliance.

"Dedicated to the growth and betterment of the appliance industry, the Institute is an *earned* recognition of the part that has been played—and will always be played—by dealers and retail salesmen in this industry."

H. W. Burritt

Vice-Pres. in Charge of Sales, Kelvinator Division.

Come in and Join

KELVINATOR'S 25TH BIRTHDAY PARTY

Field Power Factor Tests For Insulating Parts

By E. W. Whitmer*
American Gas & Electric Service Corporation, New York, N. Y.

TEN years ago it was generally recognized that there was need of a reliable field test to indicate the condition of bushings and other insulating parts in such equipment as oil circuit breakers and transformers. At that time failures were being experienced in pieces of apparatus which were shown to be good by existing tests such as conventional direct current resistance measurements. As a result of experience in maintaining such equipment and after considerable study of the insulation problem, it was decided to try the power factor method.

A few tests were conducted in 1929 which proved to be satisfactory. As a result of this experience the use of a power factor test set was obtained and a definite schedule of oil circuit breaker testing was started in the spring of 1932. After a few months this test schedule proved so highly satisfactory that it was decided to include transformers. In the fall of 1933 an additional test set was put in use to take care of the transformer work. After we had developed a suitable transformer testing technique, this work proved to be as satisfactory as the oil circuit breaker tests. Our maintenance groups soon started asking for additional test work, and this made it necessary to add a third test set in the spring of 1937. Three test sets are now in use throughout the entire year with the exception of three or four weeks each winter.

The test equipment used is that manufactured by the Doble Engineering Company. Essentially, it consists of a transformer case for supplying test voltages up to 10 kv and an instrument case with meters to indicate current, voltage, and watts. A special guard circuit is so arranged that any current flowing through it is shunted around the instruments. This circuit is useful in eliminating surface leakage over moist or dirty porcelain and also in testing transformers. The test sets are transported in small delivery trucks. The tests are usually made without removing the instruments from the truck. This test equipment proved to be rugged enough

*An address presented before the Engineering and Operation Section meeting of the Southeastern Electric Exchange, in Birmingham, Ala., Sept. 29 and 30, 1938.

Some of the tables and figures in this paper previously appeared in the October, 1938, issue of ELECTRICAL ENGINEERING in a paper, "Field Testing of Bushings and Transformer Insulation by the Power Factor Method."

Table I
Bushing Faults

Test	No. of Bushings Tested	Defective No.	Defective %	Remove No.	Remove %
A. POWER TRANSFORMER BUSHINGS (All Kv Ratings)					
First	7,729	249	3.3	282	3.7
Second	4,411	113	2.5	113	2.5
Third	834	44	5.3	18	2.2
Total	12,974	406	3.1 Avg.	413	3.2 Avg.
B. POWER TRANSFORMER BUSHINGS (All Kv Ratings - Excluding 15 Kv and Below)					
First	4,152	198	4.8	206	4.9
Second	2,477	84	3.4	57	2.3
Third	443	35	7.9	15	3.4
Total	7,072	317	4.5 Avg	277	3.9 Avg.
C. INSTRUMENT TRANSFORMER BUSHINGS					
First	2,581	74	2.9	97	3.8
Second	2,145	70	3.3	73	3.4
Third	724	43	5.9	41	5.7
Total	5,450	187	3.4 Avg.	211	3.9 Avg.
D. OIL CIRCUIT BREAKER BUSHINGS					
First	8,076	329	4.1	187	2.3
Second	7,302	287	3.9	114	1.6
Third	6,564	401	6.1	164	2.5
Fourth	1,758	83	4.7	38	2.2
Total	23,700	1,100	4.7 Avg.	503	2.1 Avg.
E. SPARE BUSHINGS (All Kv Ratings and Types)					
First	1,084	76	7.0	86	7.9
Second	1,419	168	11.8	117	8.3
Third	1,089	143	13.1	110	10.1
Total	3,592	387	10.6 Avg.	313	8.8 Avg.

Table II
Internal Faults in Equipment

Test	No. of Transformers Tested	Defective No.	Defective %	Remove No.	Remove %	Average for 3 tests % D	Average for 3 tests % R
WINDING FAULTS - POWER TRANSFORMERS							
First	1,908	291	15.2	55	2.9)	16.0	3.1
Second	1,027	173	17.0	35	3.4)		
Third	209	39	18.6	7	3.4)		
WINDING FAULTS - INSTRUMENT TRANSFORMERS							
First	1,502	451	30.1	113	7.5)	35.0	7.8
Second	1,283	497	38.6	98	7.6)		
Third	407	163	40.1	36	8.9)		

Test	No. OCB's(1) Tested	Defective No.	Defective %	Remove No.	Remove %	Average for 4 Tests % D	Average for 4 Tests % R
TANK FAULTS - OIL CIRCUIT BREAKERS							
First	1,346	304	7.5	65	1.6)	6.2	1.7
Second	1,217	178	4.9	57	1.6)		
Third	1,097	110	6.4	67	2.1)		
Fourth	295	41	4.7	10	1.1)		

(1) Multiply by 3 to obtain number of tanks.

The data given here are based on field tests made over a five and one-half year period, May, 1932, to October, 1937.

Table III
Basic Rating for Insulation Quality From Power Factor Field Tests

Apparatus	Type	By % Power Factor Good (G)	Deteriorated (D)	Remove (R)	Remarks
Bushings	Con. Filled	Below 4.0	4.0 to 6	Above 6	— —
	Oil Filled	" 3.5	3.5 to 5	" 5	Fibrous Barrier
	" "	" 4.0	4.0 to 6	" 6	Porc. Barrier
	Condenser	" 3.5	3.5 to 5	" 5	1 Piece Porc.
	"	" 3.5	3.5 to 6	" 6	Multi. Shed.
	Semi-Cond.	" 4.0	4.0 to 7	" 7	Also Bulk Type
Transformer Winding	O.T.	" 3.5	3.5 to 6	" 6	With Bushings
	"	" 3.5	3.5 to 7	" 7	Winding only
	Power & P.T.	" 3.5	3.5 to 5	" 5	—

		By Watts Loss			
Oil Circ. Brs.	Most 55 Kv	Below 0.2	0.2 to 0.5	Above 0.5	Loss in tank
	" 55 Kv	" 0.15	0.15 " 0.3	" 0.3	" " "
Herkolite Cylinder	3 "	" 0.1	0.1 to 0.5	" 0.5	Between Bands
Wood	3 "	" 0.1	0.1 to 0.5	" 0.5	" "
Bushings	Comp. & Cond.	" 0.2	0.2 to 0.5	" 0.5	Hot Collar Test

(Based on temperature of 20° C.)

Table III, above, indicates the power factor limits used in classifying insulation. Most insulation is considered good when power factor is below 3¼% and is classified as "Remove" when power factor reaches or exceeds 5 or 6 per cent.

Table IV
Typical Faults as Indicated by Power Factor Tests

POWER TRANSFORMERS

POWER FACTOR VALUES (%)

High to Ground	Low to Ground	High to Low	Fault
8.0	2.3	2.4	1 H.V. Bushing 5%
2.0	.6	.9	1 H.V. Bushing 0.2%
11.5	9.8	17.4	Before Drying Winding
2.9	1.1	1.8	After Drying Winding

INSTRUMENT TRANSFORMERS

POWER FACTOR VALUES (%)

2 Bushings and Winding	1 Bushing and Part Winding Bu. 1	Bu. 2	Fault
6.3	10.3	2.3	Bu. 1 - 24%
8.2	8.0	8.2	Moisture in Winding(1)

OIL CIRCUIT BREAKERS

Line Side ØX Watts	% P.F.	Bus Side ØX Watts	% P.F.	Closed OCB ØX Watts	% P.F.	Fault
1.97	19.0	.32	3.2	2.28	11.5	Bus Side Bu. 30%(2)
.78	8.0	.70	6.4	.96	4.9	Wood Guide Moist
.19	2.2	.24	3.1	.87	5.5	Fault in Lift Rod(3)
.91	10.0	3.38	24.0	4.16	18.2	Both Bushings Bad

Notes: (1) Windings failed in service three weeks after tests were made.

(2) This bushing was disassembled, cleaned, reassembled, filled with new oil, returned to service and failed one year later. Internal fibre parts should have been dried.

(3) Failed in service two hours after testing.

for field use, and the test results have been consistent and reliable.

Tests are now made on all outdoor station equipment operating at 22 kv and above. This includes oil circuit breakers, power, instrument, and distribution transformers. Tests can also be made on equipment which is operating at less than 22 kv if desirable and such tests are frequently made in important locations. From time to time tests are made on such equipment as porcelain insulators, wood switch sticks, wood sticks for live line work, carrier current line coupling capacitors, underground cables and lightning arresters.

Equipment Tested and Faults Located

Between May, 1932, and October, 1937, we tested 1,346 oil circuit breakers, 1,502 instrument transformers, 1,908 power transformers, and 1,084 spare bushings. Some of this equipment has been tested three or four times so that over 45,000 tests have now been made on bushings. It was originally planned to test all equipment once a year, but up to the present time we have been covering the system about once in eighteen months. Table I shows that the bushing faults which required prompt attention averages from 2.1% to 3.9%. Table II shows that faults in internal parts range from 1.7% in oil circuit breaker tanks to 3.2% in power transformer windings and 7.8% in instrument transformers.

Circuit Breaker Tests

In testing an oil circuit breaker the procedure is simply to test each bushing with the breaker open then close the breaker and make one test on each phase. If high power factor values are obtained it is occasionally necessary to disconnect leads or lower breaker tanks in order to definitely locate the faulty parts. In testing instrument transformers, it is customary to make one overall test which includes the bushings and windings. For potential transformers two additional tests are made by connecting one bushing to the 10 kv terminal and the other to the test set guard circuit. When this test is made on each of the two bushings, it is usually possible to determine whether the fault is in the windings or one of the bushings.

In power or distribution transformers one test is made on the high side with the low voltage winding grounded, a second test on the high side with the low voltage side connected to guard, and then similar tests are performed on the low voltage side.

Such parts as oil circuit breaker lift rods, switch sticks, wood hot line tools and fiber tubes for bushings are tested by placing two bands around the member three inches apart and applying 10 kv between them.

In testing a piece of apparatus such as an oil circuit breaker, it is sometimes difficult to determine the location and nature of faults without a thorough understanding of the insulation and metallic circuits. In general, if one bushing in an oil circuit breaker has a power factor very much greater than any of the adjacent bushings, there can be very little doubt but that this bushing is defective. However, if the two bushings in the same oil circuit breaker tank have a high power factor of about the same magnitude, the fault may be located in the bushings or inside of the breaker.

Interpretation of Test Results

The location of such a fault is often apparent by comparing the wattmeter readings for open and closed breaker tests. For instance, if the watts loss on the closed breaker test is very much less than that in the two bushings on the open breaker test, the fault is likely to be located in cross brac-

ing between bottom ends of the two bushings. On the other hand, if the watts loss on the closed breaker test is much higher than that for the open breaker test, the fault is usually found in the lift rod.

In testing instrument, power, and distribution transformers, it is possible to determine the power factor of several insulating paths from the overall tests which were just described. By comparing these power factors, it is frequently possible to determine whether the fault is in the winding or bushing insulation. Detailed tests such as those on bushings with windings disconnected are occasionally necessary in order to definitely locate faults which are indicated by the over-all tests. However, the tests have now been developed to such a degree that the location of many faults can be determined without the necessary labor involved in dismanteling apparatus or in moving large quantities of oil.

Table IV shows a number of typical faults as located by the power factor tests. These illustrated faults will serve to clarify some of the foregoing statements. Records of several failures which took place before faulty apparatus could be removed from service are also shown in Table IV. Such failures as these serve to emphasize the necessity of giving prompt attention to insulation which has a high power factor, even though some faulty equipment has been experimentally left in service for a year or more without failure taking place.

Table III shows the power factor limits used in classifying insulation. It will be noticed that most insulation is considered good when below 3¼% and is classified as "Remove" (unsatisfactory for service) when the power factor is 5 or 6%. These power factor limits are based on a temperature of 20° C. and all values are corrected to this temperature.

At least 80% of faults as indicated by the power factor tests are caused by moisture which is frequently admitted through defective gaskets. An investigation of 376 cork gaskets used in solid type bushings indicates that more than 60% of the gaskets over ten years of age were faulty.

Carbon deposits in oil circuit breakers have occasionally caused high power factor values. These deposits are more noticeable in some breakers than in others depending largely upon the type of arc extinction employed. In general carbon has not affected the test results when regular maintenance schedules have been followed. Transformer oil is occasionally found to have a high power factor, and this in turn results in high values being obtained for the winding insulation.

High power factor in insulating oils appears in some instances to be caused by dissolved insulation such as bushing compound, and in other cases seems to result from the presence of organic substances and is accompanied by high acid content. From tests made to date, there does not seem to be any direct relation between power factor and other tests on oil such as dielectric strength, neutralization, color, steam emulsion, etc.

Power factor tests are frequently made along with complete analysis of an oil, as these values may be useful in any future studies. In general, oil power factor has not been changed appreciably by centrifuge and blotter-press treatments. These two treatments are the only ones in general use for reconditioning insulating oils. Other methods such as chemical or Fullers earth treatments have been tried but are still on the experimental list.

All oil in station equipment is given a dielectric strength test at least once a year. Quart samples are drawn from the equipment and usually transported to a central location for tests. In transformers the oil is not reconditioned unless its dielectric strength becomes low. When overhauling an oil circuit breaker in which carbon is present, it is normal practice to replace the oil with that from a good reconditioned batch.

From the foregoing discussion and from our experience in power factor testing, the following conclusions seem to be quite obvious.

1. It has been found possible to readily locate faults by the power factor test method.

2. Moisture is usually the cause of high power factor in insulating parts. Its presence is often apparent by visual inspection upon disassembling a faulty piece of apparatus.

3. The test equipment has proved to be entirely satisfactory for field test work.

4. As indicated by our operating experiences and from studies that have gone along with the test work, the power factor of insulating parts is a good criterion in judging their ability to withstand service conditions.

5. During the past six years it has been possible to recondition or remove from service some 1800 insulating parts such as bushings, oil circuit breaker tank parts, and transformer windings. There is every reason to believe that a large percentage of these defective parts would not have been located by routine maintenance methods before actual failure would have occurred.

6. Centrifuge and blotter-press operations in reconditioning insulating oils have proved satisfactory in maintaining dielectric strength but are not adequate in lowering power factor or correcting deterioration of a chemical nature.

Giant Power Converters Open New Industrial Field

(*Continued from page* 39)

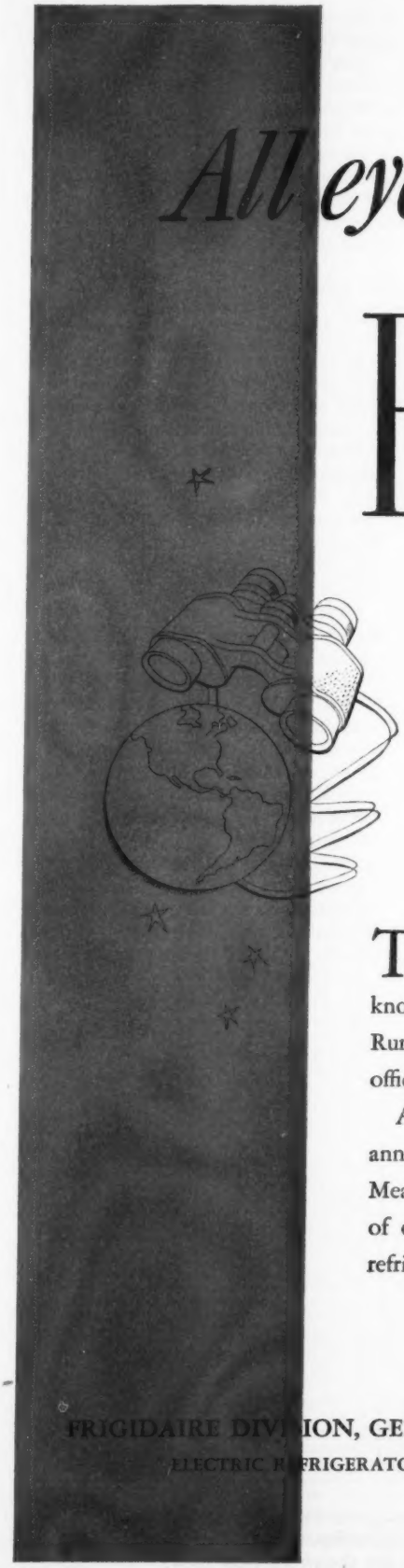
Aluminum Company of America.

The Alcoa installation is the largest assembly of rectifier equipment on one circuit ever attempted, and is the largest installation of rectifiers in the United States.

The giant apparatus was designed in the electrical laboratories of Allis-Chalmers Mfg. Co., who pioneered in developing such equipment for the use of electrochemical and metallurgical, steel mills, high power radio stations and electric railways systems.

Only recently have large rectifier units been perfected to the point where they could meet the exacting requirements of aluminum reduction plants. Although such equipment has now been used successfully for electrolytic production of chlorine-caustic, hydrogen-oxygen, zinc and cadmium, no previous installation had been attempted for the reduction of aluminum in the United States.

The Alcoa rectifier station has a capacity of 55 million watts. The station contains ten 5,500-kilowatt, double-tank, grid-controlled rectifier units, which convert alternating current to direct current. Each rectifier tank is rated 4,583 amperes, 600 volts, and has twelve main anodes operating in double, 6-phase connection.



All eyes are focused on

Frigidaire

for 1939

THAT big things are happening in the Frigidaire plants is common knowledge. But just what is going on, few know, and none will tell. Rumors are plentiful, facts scarce. Flying trips into the field by Frigidaire officials indicate unprecedented measures to assure organization preparedness.

All that can be learned now is that sensational refrigerator and range announcements will be forthcoming shortly after the first of the year. Meanwhile, a curious nation and a curious industry are waiting . . . certain of only one thing: Frigidaire, manufacturer of the world's fastest-selling refrigerator, has something big up its sleeve for 1939!

FRIGIDAIRE DIVISION, GENERAL MOTORS SALES CORPORATION, DAYTON, OHIO

ELECTRIC REFRIGERATORS · ELECTRIC RANGES · ELECTRIC WATER HEATERS

APPLIANCE *Service*

Dull Month Offers Opportunity To Improve Your Methods

By Allen Parker

CHRISTMAS has come and gone, the middle of winter is here, and we electric appliance service men find ourselves facing the slowest period of the year. Almost everyone has strained the budget for Christmas and is wondering how he will get by the collector on January the first. Perhaps you are in the same predicament and we are going to discuss your problem later.

On second thought isn't this the time that you have been waiting for to do a lot of things such as improvements in your own business? To successfully compete with others it is necessary to do a little better job, possibly a little more economically for the customer and with a little more profit to you. Undoubtedly, this saving can best be made through labor and some material.

This column for several issues has tried to bring just such thoughts to you, suggestions that might, with a little ingenuity of your own and a small investment, provide devices for doing a better job at a lower cost. Most of us believe that its best to wait until business is slack to catch up on all of these little construction jobs; hence this reminder that the slowest period of the year offers an excellent opportunity to fulfill our promises.

Haven't you envied some other company whose truck and equipment was spick and span, and whose personnel was neat as a pin, and thought that later on you would try to organize like that? Well, wouldn't it be swell to start off right now at the first of the year and take inventory of yourself and decide how much your personal appearance in making contacts with your customers is worth? To make a habit now during cold weather of buttoning up your collar and wearing a little black bow tie (for safety) and having your trousers pressed regularly? You will be surprised to learn how amazingly easy it is to continue throughout the whole year.

Not only will your customer contacts be better, but you will be more welcome at the front door than you were before at the back. Yes, I know you get a mighty dirty job every now and then and you dislike to soil a good pair of trousers and shirt, but did you ever try carrying along a smock or pair of coveralls and slipping into them to do the dirty job and then removing them after finishing it?

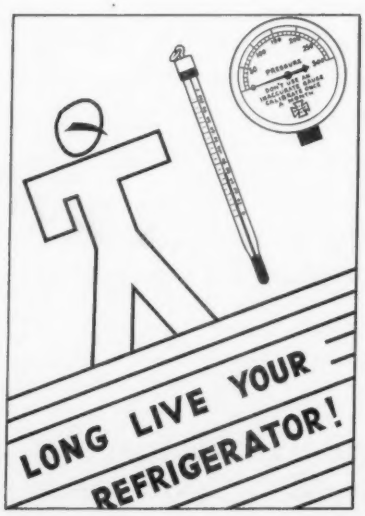
And when you are kneeling on the floor to disassemble a range or refrigerator you don't want to get your trousers soiled but, my, what a really good investment it is to provide a piece of canvas large enough to keep the customer's linoleum from getting soiled. She really appreciates those nice little things, and it sometimes saves stains that are hard to remove.

New Paint Helps

While we are tidying things up it might be a good time to use the paint spray outfit we told you how to make from an old refrigerator compressor, some few issues back, and give the old bus a bright new coat. It will be more conspicuous and prove to be a little better advertisement. Those ideas on brightening up your shop should certainly fill your spare moments.

Now in the first paragraph I stated that you might be in the same class I am in, that is, with those who cannot afford to put all their time into improvements. However, how are you going to pry any money away from anyone right after the holidays? I hope you are not like the proverbial plumber who waits for business to come to him. So let's take a tip from the most aggressive company in your town. I'll bet they put on some kind of inducement sale and go out and get the business.

Why not sit down now and make



TO OUR COMMERCIAL
ELECTRIC REFRIGERATION CUSTOMERS:

Suppose you should learn that your refrigerating system which has been in service for several years is wasting electricity . . . . is wasting money for you!

You'd have this waste stopped without delay, wouldn't you?

Such waste is possible in any refrigerator that is several years old. Like automobiles and trucks, electric refrigeration equipment needs "tuning up" now and then for best performance. More than that, electric refrigeration has improved in recent years by research and invention. Many of these new improvements can be adapted to older equipment with ease and economy.

We offer you — without charge or obligation — a means to check your refrigeration equipment for possible wastes of energy and efficiency. Such a check-up may result in lowering your operating cost considerably . . . . may result in saving you dollars and cents during 1935.

Our plan is explained briefly on the following pages, and we believe it deserves your thoughtful attention.

Yours very truly,

Service Department

Telephone_____Ask for_____

Typical pages from a booklet prepared for direct solicitation of commercial refrigeration plant rehabilitation. At left is cover and right, a forceful letter. Other pages are shown on next page. . . .

a list of your customers and send them a caricature of an ailing waffle iron, percolator, domestic iron, electric range, refrigerator or any other electric appliance and offer a special price for repairing those that are giving trouble? And why not do it for a special price? Its filling a slack period and you hope to do it on a volume basis.

If that doesn't bring the business why not try the telephone? With your sales ability you will certainly produce some business.

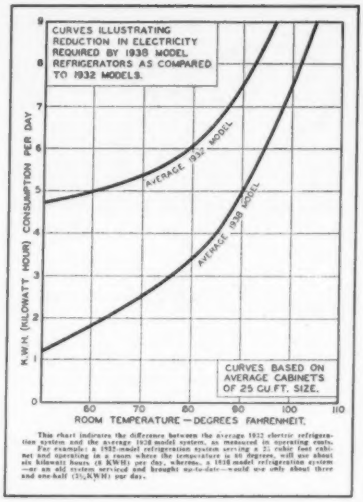
Make Personal Calls

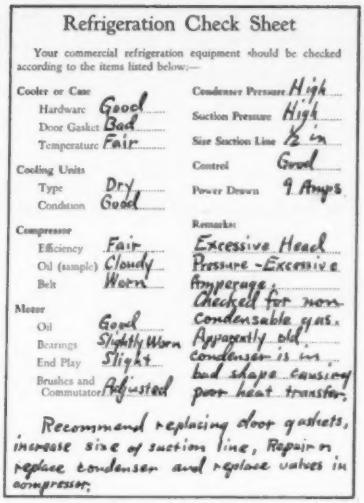
Of course, I know you need some big jobs and to get these it might be best to check your customer records and pick those major appliances which are now getting old. Make a personal call on these customers. Almost invariably you will find accessories that have been broken or lost that your customer has been doing without but would really like to get replaced.

Also, you will find repairs such as gaskets for refrigerators, surface units for ranges, etc., that have been needed but which negligence on the part of the customer has delayed. A little inducement is almost sure to produce results. A good deal of refinishing work can be done in the winter, especially on refrigerators. Most users cannot be without them long enough for the work to be done in the summer but can usually make arrangements to get by without them for a few days in the winter.

We have discussed the possibility of promoting service for small appliances and major domestic appliances, but we haven't yet pulled the ace out of our sleeve—that is, commercial refrigeration. Ordinarily this is very slow work in winter time, but it can be made productive through one method and that is an educational program that will prove to the user the value of rehabilitating his equipment during the period when he can best do without it and the time you can do it most economically for him.

Naturally, the question arises as to whether he needs any repairs. Now is the time to educate him to appreciate the value of again making his equipment produce the original efficiency. The operating economies in the power bill derived from such rehabilitation and the dependability to be expected from a machine that has been rebuilt will justify considerable expense.


CURVES ILLUSTRATING REDUCTION IN ELECTRICITY REQUIRED BY 1938 MODEL REFRIGERATORS AS COMPARED TO 1932 MODELS.
K.W.H. (KILOWATT HOUR) CONSUMPTION PER DAY
AVERAGE 1932 MODEL
AVERAGE 1938 MODEL
CURVES BASED ON AVERAGE CABINETS OF 25 CU.FT. SIZE.
60 70 80 90 100 110
ROOM TEMPERATURE—DEGREES FAHRENHEIT.
This chart indicates the difference between the average 1932 electric refrigeration system and the average 1938 model system, as measured in operating costs. For example: a 1932-model refrigeration system serving a 25 cubic foot cabinet and operating in a room where the temperature is 90 degrees, will use about six kilowatt hours (6 K.W.H.) per day, whereas, a 1938 model refrigeration system—or an old system serviced and brought up-to-date—would use only about three and one-half (3½ K.W.H.) per day.


Refrigeration Check Sheet
Your commercial refrigeration equipment should be checked according to the items listed below:—
Cooler or Case
Hardware Good
Door Gasket Bad
Temperature Fair
Cooling Units
Type Dry
Condition Good
Compressor
Efficiency Fair
Oil (sample) Cloudy
Belt Worn
Motor
Oil Good
Bearings Slightly Worn
End Play Slight
Brushes and Commutator Adjusted
Condenser Pressure High
Suction Pressure High
Size Suction Line 1/2 in.
Control Good
Power Drawn 9 Amps
Remarks:
Excessive Head Pressure - Excessive Amperage. Checked for non condensable gas. Apparently old condenser is in bad shape causing poor heat transfer.
Recommend replacing door gaskets, increase size of suction line, Repair or replace condenser and replace valves in compressor.

The chart at the left showing increased efficiency of new refrigeration machines is always effective. A check sheet such as that shown at the right has a business-like appearance and its preparation gives the service man exact knowledge of customer's plant. . . . .

No one waits until an automobile stops before he has a fouled plug checked and repairs made to take care of it. And the autoist replaces rings and pistons in the belief that it will increase the efficiency of his motor and save him gasoline and oil. Couldn't this same story be put over to your commercial customers?

Take them into your confidence enough to explain to them the every day duty of the different parts, why the normal wear of parts require periodical adjustment and replacement. This part of the story might best be understood by the customer if you supplied it in practical terms in the form of a small booklet, that he could read during his spare moments.

Stress New Efficiencies

This booklet might explain the advantages of bringing the old equipment up to modern standards by the use of refrigerant or water cooled cylinder heads, improved condensers, controls, fans, coils, etc. These are all suggestions of interest to the user and, except by buying new equipment, can only be obtained from a service organization. An illustration that might carry the point home to the user of the advantages to be gained from a rehabilitated modern compressor over an obsolete unit would be a simple chart showing the decrease in operating and maintenance cost for an average installation resulting from rehabilitation.

After giving the customer time to absorb a few facts from the booklet, follow it up, and give the customer some additional information free, that is, check his equipment and supply the information as to the true condition it is in.

However, although you are supplying him the information, it is of real value to you as it serves as a basis upon which to figure the cost of overhauling or rehabilitating the equipment. If you would like for this information to be more business like and more impressive to the customer, supply it on a neat check chart rather than as a mass of figures scribbled on a piece of paper. Even though the chart may be ever so simple it will pay big dividends.

With the facts before the customer proving that he can get the work done more economically now, eliminate unnecessary interruptions next summer for costly repairs, increase the efficiency, and lower the operating cost of his equipment, how can he turn you down? The cards are stacked in his favor, but you also have a winning hand. When you do get the job, make the outside appearance justify the good job you've done by using a little paint. A satisfied customer will mean more jobs for you next winter, and the rush summer months will take care of themselves. Best of luck to you in 1939!

MOTOR Service

Small Points of Importance In Armature Winding

7—Fishpaper Pads Over Coil Ends

By A. C. Roe

Railway Motor Engineer
Westinghouse Electric & Mfg. Co.

A SMALL strip of fishpaper measuring about 1½ inch long by one inch wide and 0.015 inch thick often means the difference betwen a clear winding and one full of short-circuits. This strip of fishpaper is used with drop-type coils, and short-type coils that have the top leads brought off from the bottom of the slot section; or in any winding where the top leads of a coil are brought up between adjacent coil sides, and pass over the top of a coil end ahead of the coil from which the leads are attached.

The front end of a winding using drop-type coils is shown in Fig. 1. The winding is ready to be insulated before the top leads are brought down. Sharp edges are formed along the tops of each coil end as shown. Now, leads come up between the adjacent coil ends, and when they are being connected to the commutator, each individual lead is pulled down across the layer of top coil ends, in other words, across the sharp edges. Thus the concentration of pressure is along the edge of the top coil end in front of the leads, Fig. 3. Then, if a band is applied at the end of the core, the leads are pulled down more than the coil ends, and there is a cutting action of the leads into the top edge of the coil ahead.

If this cutting and rubbing action that is set up and concentrated under the top leads, as shown in Figs. 1 and 3, is not compensated for by inserting reinforcing pads of insulation, short-circuits between leads and coil ends will inevitably result.

These reinforcing strips are applied as follows: After the front end has been made ready to insulate as in Fig. 1, the fishpaper strips are bent L-shaped and placed over the coil end with one side of the L projecting down between the coil side and group of leads. The strip should be long enough to extend slightly on each side of the group of leads. If the space between the leads and coil side is too wide to grip the fishpaper strips, they can be held in place by running on a turn of friction tape and catching each strip as inserted with the second turn of the tape.

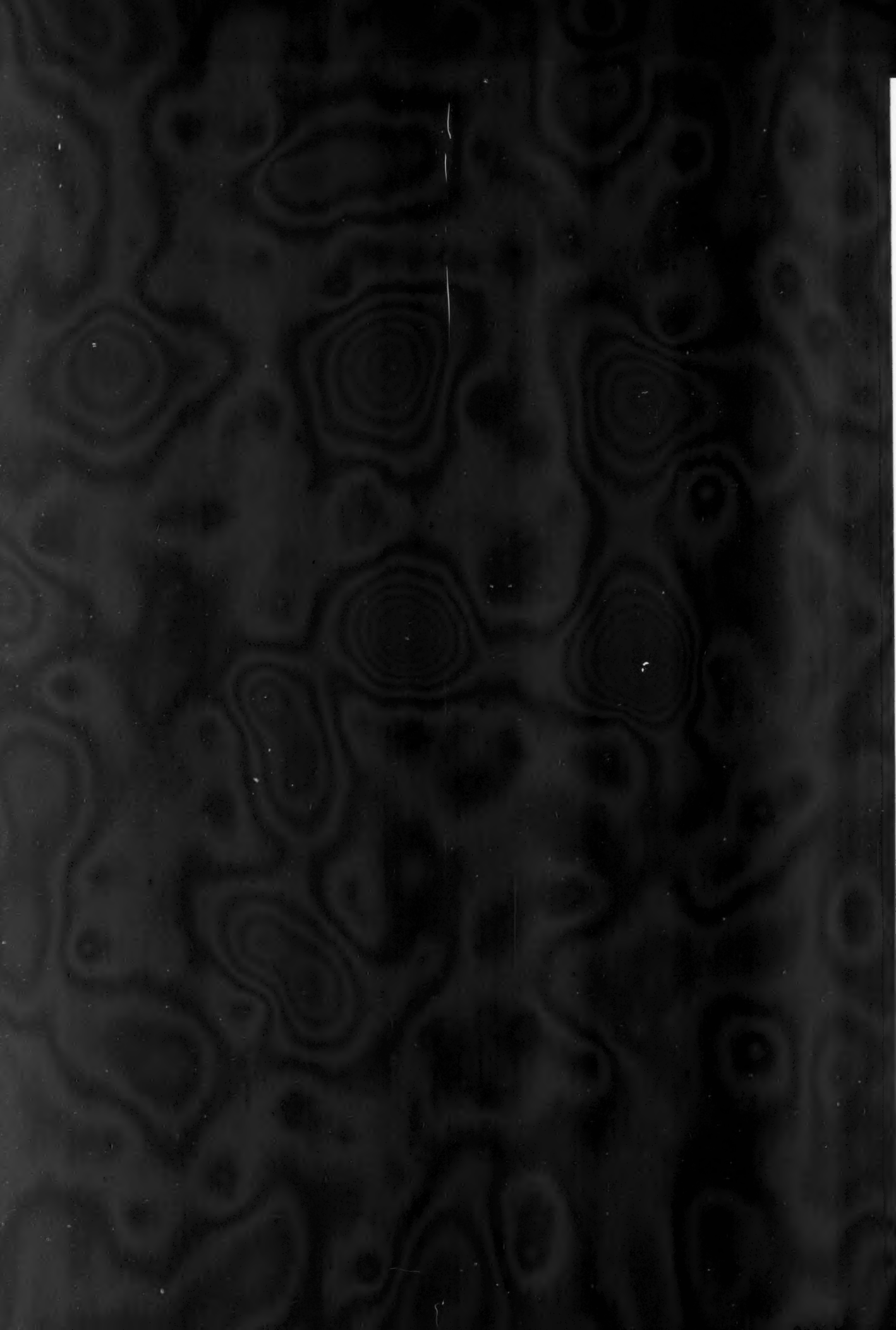
The front end insulated with the fishpaper strips in place ready for connecting the top leads is shown in Fig. 2. Note how the insulation, both tape and strips, has been applied to protect every section of the front top coil ends.

The fishpaper strip can be seen in Fig. 3, projecting to the left of each group of coil leads; the front end is ready for banding. In placing the protecting strips of fishpaper, they should be cut to dimensions that will permit them to be well secured, without excess projections beyond coil ends or winding. A study of Figs. 1 and 3 will indicate the care taken in this respect.

For all windings using class A insulated coils, and round wire, a strip of 0.015 inch thick fishpaper is sufficient, but it is important that the grain of the fishpaper run parallel to the bend in the strip; this means that the leads are laid against the grain in the fishpaper strip.

For windings using class A insulated coils made from square or rectangular wire, either a strip of treated duck 0.030 inch thick

Fig. 1 (Left)—The strips are placed over the top coil end, in front of the leads from the adjacent coil, extending down between leads and the coil. Fig. 2 — The strips are in place on top of the coil ends, held by tape used for insulating the front end of the armature. . . .



We Can Help
You Do Your Buying

ELECTRICAL SOUTH WILL GLADLY HELP YOU DO YOUR BUYING . . .
TELL US WHAT YOU WANT AND WE CAN SAVE YOU TIME AND POSTAGE

The manufacturers who advertise their products in ELECTRICAL SOUTH are obviously making a special and direct effort to secure southern business. These manufacturers, in nearly every case, have representatives located throughout the South and have distribution facilities to give the southern trade prompt and efficient service.

Look over the items advertised and described in this issue of ELECTRICAL SOUTH and if you will tell us the ones in which you are interested, we shall be glad to have manufacturers send you further information about them.

You will find listed on the back of this page the firms whose goods are advertised. A number is placed immediately preceding each name. On the post card below are shown corresponding numbers. All you have to do is to circle or check the numbers on the card that correspond with the numbers which precede the names listed on back of this page. Mail the card to us. It requires no postage. We will gladly forward your name to the manufacturers indicated by the numbers checked and ask them to send you additional information.

No Postage Required . . .

THIS CARD IS FOR YOUR CONVENIENCE

See Names of Manufacturers On Back of This Page

Postage Will Be Paid By W.R.C. Smith Pub. Co.

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 882, SEC. 510, P. L. & R., ATLANTA, GA.

ELECTRICAL SOUTH

1020 GRANT BLDG.

ATLANTA, GA.

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CHECK OR CIRCLE NUMBERS—SIGN—MAIL

January, 1939

Electrical South, Grant Bldg., Atlanta, Ga.

Gentlemen: I am interested in the advertisements of the firms checked. Please forward my name to manufacturers or nearest representative or jobber.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34
35 36 37 38 39 40 41 42

Name _____ Title _____

Company _____

Address _____

City _____ State _____

Readers' Service

No Postage Required

Often our readers would like to secure additional information on certain lines advertised in the paper but do not have the time to write for it.

Use This Card

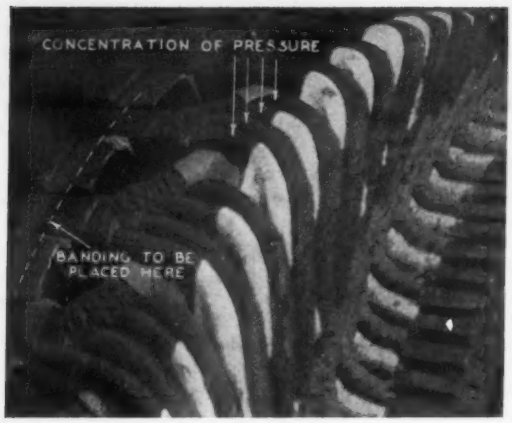


Fig. 3—In this figure, the top leads are all shown in place. The strips project out from under these leads wherever they cross sharp adjacent coil ends. The front end is ready for banding. The strips should be large enough to be well secured but should not project out excessively. . . .

or fishpaper 0.023 inch thick is sufficient.

For all windings using class B insulated coils made from round, square, or rectangular wire, a strip of treated asbestos cloth 0.035 inch thick, preferably cut on the bias, is recommended.

A little care in selecting the proper material and applying it correctly to windings that have leads brought up through and over end coils will pay dividends in freedom from short-circuits and a longer rewind life.

What Do You Know About Motors? . .

By A. C. Roe

CHECK your knowledge of motor characteristics and repair methods by means of these "True or False" statements. Use your pencil and underline your answer as to whether the statement is true or false; then turn to page 52 for the correct answers.

(1) The number of active wires, i.e., coil ends not fillers, in the commutator necks of direct current armatures is a check on the number of wires in parallel per a single coil. True or False?

(2) The term "single coil" denotes a coil that is used alone. True or False?

(3) A conductor is one who leads a band. True or False?

(4) A strand is a part of the sea shore. True or False?

(5) Increasing the copper area in any armature, stator or field coil, will increase its heating. True or False?

(6) Increasing the copper area in a winding ten per cent will permit increasing the rating about five per cent. True or False?

(7) When banding direct current armatures, the holding clips should be spaced a pole pitch apart. True or False?

(8) Tin solder is harder and has a higher melting point than half-and-half solder. True or False?

(9) The term "crossover" when applied to armature or field coils means the crossover at the end of each turn in the same layer. True or False?

(10) "Wound in layers" is a term used in coil winding to indicate that the wires are laid uniformly. True or False?

(11) "Hit and miss" is a method of winding coils with small round wire. True or False?

(12) A "gang mould" is used for mass production of racketeers. True or False?

(13) To "stub up" the connections of an a-c winding means to trip it over. True or False?

(14) A "star" connection is one that makes you "tops." True or False?

(15) "Chord factor" indicates the breaking point of a cord or string. True or False?

(16) "Wound straight up" applies to armature or field coils that are wound in layers. True or False?

(17) "Distribution factor" indicates the percentage of a product allotted to wholesale dealers. True or False?

(18) A "shuttle coil" is one that runs back and forth in a motor or a generator. True or False?

Typical example of hit-and-miss winding on gang moulds.

Practical Accounting For Service Shops . .

By W. G. Hoffman*
Tenn. Armature & Electric Co.
Knoxville, Tenn.

THE ultimate purpose of an accounting system is to provide a means for furnishing owners and managers with accurate information as to the activities of a concern, which will assist them in planning future operations and business policies.

In endeavoring to outline briefly a system for the electrical contracting and service shop, I am mindful of the fact that what is suitable for one concern is not necessarily adapted to another. With our company, however, this system has worked out very satisfactorily.

Our business is divided into three departments:

1. Repair, under which comes rewinding of motors, armatures, generators, and service calls.

2. Construction, made up of power and light wiring, power plant installation and work of this nature.

3. Merchandise, covering the sale of motors, generators, renewal parts lamps, etc.

*Adapted from an address presented before the annual convention of the National Industrial Service Association in Chicago.

All of our job tickets are costed and our cost accounting system is tied in with our general ledger. An example of our method of handling an order, and also the accounting procedure involved will illustrate how this is done.

We receive an order to repair a motor. At that time a job ticket is made out in duplicate, the original goes to the office and the duplicate copy to the shop foreman. We also use a rubber stamp, which is applied to the original and duplicate copies of our job tickets for a motor repair job. This stamp lists practically all items that are normally required to make repairs to a motor and we have found it very helpful in eliminating errors. It also assures us of having a complete description of the repairs made when the job ticket is turned back to the office for billing.

These tickets carry a job number and the office copy has space provided on the back for recording the labor. This is taken off daily from the time cards.

When the job is completed the shop foreman checks his copy of the ticket to see if any extra work was required, such as installing bearings, and if so, he corrects his copy. This is then given to our stock keeper, who has a requisition of all the materials used on this job. These various materials are then deducted from our Kardex inventory cards and all items are costed.

Continuous Inventory

Our inventory cards supply us with a continuous or perpetual inventory of materials on hand, supported and controlled by the general ledger account. Our individual inventory cards furnish a means of recording the cost price of each item of material in stock. They also furnish a safeguard against loss and enable us to watch our stock more closely, eliminating possible overstocking.

As I have stated, all items on the requisition are costed and this together with duplicate copy of the job ticket is then returned into the office and the job is ready to bill. The original copy is removed from the file and checked with the foreman's copy to see if the correct description of all work is recorded. The cost is then summarized as follows: labor cost—material cost—job expense—prime cost—overhead—and total cost. The selling price is then placed on the ticket and one can readily see if the job has been profitable.

The customer's invoice is typed from the information on the cost ticket and a copy is made for posting purposes. The cost ticket is now ready to be entered on the sales journal.

But, before going into this, I would like to state that we have three inventory accounts: inventory of productive labor, which is all labor that has been applied and charged to various jobs; inventory of materials; and inventory of job expense, such as freight, express, parcel post, etc. The job expense items are paid out of our petty cash fund and all items used in connection with a job are charged to the correct cost ticket as job expense.

At the end of the month the petty cash vouchers are compiled and the total amount of the job expense items are charged to this account. During the month all purchases, including payrolls, are recorded in the purchase journal and at the end of the month, the various columns are totaled and posted to the correct general ledger account.

The sales journal has columns for the various accounts and when we enter the cost ticket we charge accounts receivable and credit sales. These amounts are the selling price, which we placed on the cost ticket. From the summary of cost we obtain the amounts for crediting the inventory accounts and charging cost of sales. At the end of the month all the columns are totaled and posted to the general ledger accounts.

During the month all items affecting the three inventory accounts are recorded in the purchase journal and are charged to the general ledger accounts at the end of the month. Also, the three inventory accounts receive credit for all inventory items used on jobs billed during the month. These totals are secured at the end of the month from the sales journal.

You can readily see at the end of the month the balance that appears in the inventory accounts reflects a true and accurate inventory of work in process and materials on hand. With this system it is very easy to prepare an accurate balance sheet and income and expense statement without taking a physical inventory.

We are by no means a large shop, and this system or a similar one can be readily installed in the smaller shops with no great expense. I sincerely believe no matter what size the shop, a complete cost record is vitally important and monthly income and expense statements will give operating conditions of the business as well as overhead which certainly varies, especially as in the present period of recession.

What Do You Know About Motors? . .

These are correct answers for the "True or False" statements listed on page 51.

(1) *True.* The number of "wires per bar" divided by two equals the number of wires in parallel per a single coil, or strands per a conductor.

(2) *False.* A "single coil' is one connected between two commutator bars. For example, with 49 slots and 97 bars there will be 97 single coils.

(3) *True.* But in electrical work a conductor is a wire or a combination of wires in parallel, of low resistance, used to carry current.

(4) *True.* But in electrical work, a strand is a component part of a conductor, i. e., in a cable each fine wire is a strand, or in a coil having two wires in parallel, each wire is a strand.

(5) *False.* Increased copper area permits an increase in rating as the resistance and heating are reduced.

(6) *True.* Up to certain limits the rating can be increased approximately one half of the per cent increase in copper area.

(7) *False.* Good spacing of clips is one every fourth slot, i. e., 1 and 4 slot pitch.

(8) *True.* The melting point is around 305 degrees cent. and tin solder is harder. Its major feature is its critical melting point, i. e., it doesn't soften at lower temperatures but runs freely at the proper temperature.

(9) *False.* "Crossover" indicates the point in a coil where one layer ends and the next layer starts, i. e., crossover between layers.

(10) *True.* The turns are applied like a screw thread, i. e., right to left, left to right, etc., the only crosses being between layers.

(11) *True.* When winding some coils no attempt is made to build the wires up in layers. They are wound on "mush" or "hit and miss."

(12) *False.* A "gang" mould is

(*Continued on page* 66)

POWER COMPANY News

Memphis Power & Light Co. Adopts "Yardstick" Rates .

THE National Power & Light Company has elected to fight the encroachment of Federal electric power by meeting the rates of the Tennessee Valley Authority in the Memphis, Tenn. area.

At the same time, it left up to its stockholders a decision on whether to accept or reject an offer of $17,385,000 by the City of Memphis for the gas and electric properties of its Memphis Power and Light Company subsidiary.

The action was interpreted in some quarters as the beginning of a "knock-down-and-drag-out" battle, a term which a local political leader is said to have used recently in describing future action by the city should its offer meet a rebuff.

It was the first time in the recollection of utility men in this vicinity that a power company had chosen to compete with the Tennessee Valley Authority on the basis of the Federal government agency's "yardstick" rates.

Memphis last summer began building its own distribution system for the sale of TVA power, undercutting private rates. Construction was interrupted when a tentative agreement was reached September 30 for purchase of the utility's electric property. The discussion was reopened later to include gas properties and finally ended in the decision for a competitive showdown.

W. J. O'Brien, president of the Memphis Power and Light Company, in a letter to the city board of light and water commissioners, said the utility was ready to carry out the September agreement by calling for transfer of the utility's electric properties only for $13,500,000. Of this the TVA was to have paid $2,000,000 for certain lines.

But, since it was not the desire of the city to go through with this, Mr. O'Brien said, the company has reduced its electric rates to the level of those charged for TVA electricity by the City of Memphis.

The utility's new rates represent a reduction in its charges of from 25 to 40 per cent.

Mr. O'Brien said that, in addition to the rate reduction, the company stood ready to negotiate immediately with the TVA "for our power requirements in the city and adjacent territory."

New Officers Selected for Oklahoma Association . .

Principal officers of the Oklahoma Utilities Association were elected at a special meeting of the board of directors at Tulsa, Okla., December 8.

The officers were chosen to serve throughout 1939 and include: Glen C. Kiley, Oklahoma City, president; Frank B. Long, Tulsa, first vice president; R. W. McClure, Sand Springs, second vice president; W. R. Emerson, treasurer and Kate A. Niblack, secretary, both of Oklahoma City.

The gas and electric divisions of the association will meet January 19 to choose their division officers. The board of directors also will meet on that date to appoint committees to arrange the program for the annual convention of the Oklahoma Utilities Association to be held at Tulsa, Okla., March 20 and 21, 1939.

Harvey C. Couch founder of the Arkansas, Louisiana, and Mississippi Power Companies and president of the Arkansas Power and Light Company, was awarded a 25-year gold service pin, on the anniversary of the creation of the first company begun at Malvern, Arkansas. This was also conferred upon two other officials of the Arkansas utility, W. E. Baker, treasurer; and J. L. Longino, director, at the annual Christmas dinner-dance, sponsored by the Women's Committee of the home office, Decmber 12, at the Hotel Pines, Pine Bluff, Arkansas.

Coming Meetings Announced by Southeastern Electric Exchange

The Sixth Annual Conference of the Southeastern Electric Exchange will be held at the Ponce de Leon Hotel, St. Augustine, Florida, on Thursday, Friday and Saturday, March 30, 31 and April 1, 1939 respectively. Details concerning the conference will be announced shortly after the first of of the year.

The second meeting of the Employee Activities Committee under the chairmanship of W. A. Moore, vice president, Mississippi Power and Light Company, will be held at the Piedmont Hotel, Atlanta, Georgia, on Friday and Saturday, February 10th and 11th, 1939.

Interest in Modern Kitchen Bureau Program Increases .

Dr. George W. Allison of The Modern Kitchen Bureau has been active in the Southeast in recent weeks, addressing large audiences in Georgia, Alabama and Florida in the interests of the Bureau's all-electric kitchen program.

Dr. Allison spoke recently before a group of dealers and salesmen at St. Petersburg, Fla. Several days later, he addressed the merchandising and advertising groups of the Southeastern Electric Exchange. In Birmingham, Alabama, he spoke before a gathering of builders and architects, delivered three radio addresses, and addressed a cooking school group and a meeting of the members of the sales department of the Birmingham Electric Company.

B. F. Weadock, Jr., The Modern Kitchen Bureau's field representative regularly assigned to the Southeastern States, has meanwhile been calling on distributors,

(*Continued on page* 64)

WHOLESALERS' Activities

1939 Marks 70th Anniversary Of Graybar Company . . .

Celebrating its 70th anniversary in 1939, Graybar will mark the occasion with a comprehensive advertising and sales promotion program. Trade papers, direct mail, and various promotions are part of the program to acquaint Graybar's customers, prospective customers, suppliers, and employees with its history, its growth and its prospects. In this connection, there will be published a comprehensive and interestingly descriptive book that will detail not only the history of the Graybar Company but also will outline the history of the electrical industry which forms a fitting background for the story of the growth of the company that now bears the name Graybar.

As a part of its anniversary program, the company plans to hold a nationwide banquet for its employees. These banquets, held on the same day at the same time in the 83 cities in which Graybar has distributing houses, will constitute the highspot of the anniversary campaign in so far as the employees are concerned. A program is under preparation for this banquet that will make it an event of importance to be remembered by every Graybar man and woman who attends.

Graybar has come far in the seventy years since Gray and Barton founded the business in Cleveland, and so has the electrical industry. With its 83 branches, its catalog containing some 60,000 electrical items, manufactured by some 300 suppliers, and its thousands of customers ranging from railroads to contractors, broadcasting stations to electrical dealers, Graybar is today, as it has been, a symbol of efficient, economic distribution of electrical products.

Nelson Company Adopts Burks in Texas . . .

L. J. Bachle, president of N. O. Nelson Company, plumbing and heating supply jobbers, with headquarters in St. Louis, recently announced the adoption of the Burks line of turbine pumps, water systems, condensation return units and the Autobuilt deep well pump by the six Nelson houses in Texas.

The Texas branches are located at Beaumont, Houston, Austin, Waco, Dallas and Wichita Falls. In addition to the Texas branches, N. O. Nelson Company operates wholesale houses at Salt Lake City, Utah; Pueblo, Colorado; Joplin, Jefferson City, and St. Louis, Missouri; Memphis, Tennessee; Jackson, Mississippi; Birmingham and Montgomery, Alabama.

Mr. Bachle states the adoption of the popular Burks line by the Texas houses is the first definite move by N. O. Nelson Company to give increasing attention to the importance of developing pump and water system business, by the entire Nelson organization.

J. O. Alton, Burks southwestern district manager, has spent six weeks with the Nelson houses in Texas, assisting in establishing the sales program on the Burks line.

Memphis Supply House Adds Birdseye Lamp Line

The Riechman-Crosby Co., Memphis, Tenn., has been selected by McCrory's chain of 10 cent stores as one of four distributors in the United States to serve their stores on Birdseye lamps, which are manufactured by the Birdseye Electrical Co., of New York. They will serve the entire Eastern section of the country.

Lowenstein's, leading Memphis Department store, has remodeled its windows to permit of an even more impressive use of Birdseye Spotlites, and concentrators, through the sales efforts of C. T. Norton, electrical department salesman of the Riechman-Crosby Co. They are also planning to use Birdseye lamps throughout the interior as well.

Southeastern Manager Celebrates 30th Year with Graybar . . .

Just thirty years ago in December, J. H. Pearson, Jr., a 1904 graduate of the University of North Carolina and a native of that state, started in as a salesman at the New York branch of the Western Electric Company. After three years in the north, Mr. Pearson went back south as salesman, first at Richmond, then at Norfolk. In 1918 he was appointed sales manager of the Norfolk house. Two years later he went to Charlotte as sales manager there, and within four years became manager at that house. In 1926 he was transferred to the main house at Richmond as manager. In 1937 he received his appointment as southeastern district manager with headquarters still at Richmond.

Continued good business is reported by the Electrical Supply & Equipment Company of Greensboro N. C., which operates the spacious warehouse and sales floor shown above. In the picture, reading from left to right are H. M. Sutherland, P. R. Boone, B. I. Sherrill, Nellie Craten, P. R. Fogleman, A. M. Clegg, P. B. Phipps, J. H. Hoagland and Howard Hull. Mr. Hoagland is associated with American Steel & Wire Company.

ELECTRICAL Books

Winding Alternating Current Motor Coils . . . . . .

By G. A. Van Brunt and A. C. Roe. Published by McGraw-Hill Book Co., Inc., 330 West 42nd St., New York, N. Y. 281 pages, 6 1/4 x 9 1/4 inches, profusely illustrated. Price. $3.00.

Written by outstanding authorities in the motor rewinding field, this new publication provides what is perhaps the most comprehensive discussion available on the winding of alternating current motor coils. The book has been written in a manner that will enable the practical motor repairman, as well as the engineer, to utilize it to advantage in solving the motor rewinding problems that turn up from day to day in the shop.

The first part of this book is devoted to the design, construction, and installation of modern types of coils for both low and high-voltage service.

In the later chapters, the advantages and limitations of various types of old windings are discussed, with suggestions and examples of the best procedure in replacing them by modern designs. This section of the book will be found particularly valuable because with some of the older types of machines, the reductions in losses that can be obtained through the use of a modern winding will pay for the job in less than a year.

The last chapter presents the latest information available on the properties and applications of the glass-fabric insulating materials that have recently been developed. These materials possess many unique and valuable properties which, it seems certain, will lead to their widespread use in rotating and other kinds of electrical apparatus.

The value of the book is greatly increased by the hundreds of diagrams and photographs used throughout to explain the text.

Fundamentals of Electrical Engineering . . . . .

By Myril B. Reed, University of Texas. Published by International Textbook Company, Scranton, Pa. 326 pages, flexible covers, illustrated. Price, $3.00.

This new textbook provides a clear and concise treatment of the fundamentals on which electrical engineering is based. Although intended as a first course in electrical engineering, the fact that electrical engineering must become more and more mathematical is recognized, and the material of this text has been presented with this in mind. No attempt has been made to avoid the use of mathematics.

In the treatment of electric circuits, the much-used double subscript method of a-c circuits has been used for d-c circuits. The author has found, through many years of presenting d-c circuits in this manner, that the student can get a more effective knowledge of circuit treatment in a much shorter time. This method has the added advantage that a new method of analysis need not be learned later in the study of a-c circuits.

The problems of the text have been written so that some thought on the part of the student is required to solve them. Relatively few of the problems can be solved by straight substitution in formulas. As the student progresses through the text, more of the material is left for him to work out, also the mathematical equipment required grows larger but not, of course, beyond what is expected of the student in his parallel mathematics course.

Extension Course on Transformers

Published by Industrial Relations Department, Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. Price. $2.50.

This is an entirely rewritten and expanded edition of the Westinghouse extension course on transformers. Written by Westinghouse design and application engineers, each dealing with his specialty, the course provides splendid material for group study in classes, under the direction of a competent leader. However, the course is arranged in progressive assignments with appropriate questions for self-examination and will be found suitable for home study.

Some idea of the scope of this course may be obtained from the chapter headings which include: Function; History of Development; Distribution, Power and Auto Transformers; Classification; Construction, frames and tanks; Circuits, current and magnetic; Windings and Insulation; Methods of Cooling and Temperature Control; Bushings; Oil, its functions and treatment; Inert Air Transformers; Evaluation of Losses; Mechanical Stresses; Connections; Operation; Harmonics; Tests; Installation; Maintenance; Storage; Current Limiting Reactors; and Tap Changers.

This course will be found particularly valuable to anyone concerned with this class of apparatus in the electric power field. Because of its recent revision, it includes latest developments in many phases of the subject. The many illustrations and diagrams included help the reader to understand the text material.

Transformer Engineering

By L. F. Blume, G. Camilli, A. Boyajian, and V. M. Montsinger. Published by John Wiley & Sons, Inc., 440 4th Ave., New York, N. Y. 496 pages, 6 x 9 inches. Price, $5.00.

This treatise on the theory, operation and application of transformers is designed primarily for engineers interested in a comprehensive discussion of the specification, selection, application and operation of transformers.

In this publication, the authors have placed emphasis on the essential physics concerned in each problem. The treatment is non-mathematical, particularly suited to the operating engineer, but mathematics is included wherever necessary for the adequate solution of a problem. A great deal of practical information is given concerning methods of calculation and properties of transformers.

Written by a group of outstanding transformer engineers, the volume provides one of the most authoritative, up-to-date and practical sources of information on this subject for the practicing engineer. The book is particularly suitable for addition to any engineer's library because of the fact that only "permanent" material has been included, that is, the sort of fundamental data that do not rapidly become obsolete.

Air Conditioning

By James A. Moyer and Raymond U. Fittz. Published by McGraw-Hill Book Co., Inc., 330 West 42nd St., New York, N. Y. 455 pages, 6 1/4 x 9 1/4 inches, illustrated. Price, $4.00.

This is the second edition of this complete and practical treatment of air conditioning, both on its theoretical side and in the selection and operation of equipment for a wide variety of applications. In this new edition, the first chapter has been entirely rewritten with the object of improving it in the light of recent practice, and with the object also of simplifying those parts that have been rather difficult for the average student and engineer. The needs of the practical man in this rapidly growing field have been constantly in mind in this revision.

Of especial interest is a new chapter giving exhaustive and authoritative data on sun effect, heat transmission through building materials and methods of calculating and selecting the proper size of unit air conditioners of various types.

The chapter on automatic control apparatus has been rewritten with much attention to the complete description of the operating details of the modern types of positive and intermediate thermostats.

In the chapter on residence air conditioning, interesting and useful data are given from actual tests obtained by cooling a small residence first with an ice-melting system and later with a mechanical-refrigeration system. In this connection, first costs and operating expenses are compared in detail.

Another new feature of the second edition is the addition of a set of numerical problems devoted almost entirely to design calculations.

MANUFACTURERS' News

Packaged Units Key to New Air Conditioning Distribution Plan .

By means of packaged air conditioning units from 1 to 15 tons, Westinghouse is expanding distribution to include ordinary warm-air heating, ventilating, oil burner and sheet metal contractors since no engineering of the refrigeration cycle is required. They have made summer air conditioning as easy as an automatic forced air furnace. Multiplicity of retail outlets should open the vast air conditioning market represented by apparel shops, offices, restaurants, barber shops, drug stores, candy shops, mortuaries and similar commercial businesses which do not require more than fifteen tons capacity.

To give the smaller-town heating and ventilating concerns a year-around, all-market, one-brand line to sell, Westinghouse Home Heating and Air Conditioning will also be offered. There are now three lines of gravity coal-fired furnaces and a line of gravity gas-fired furnaces; conversion oil burner; blowerfilter units; boiler-burner units for oil and later for gas; winter air conditioning units for oil, gas, hand or stoker-fired coal, and for summer cooling, packaged units which may be installed in the supply duct of winter air conditioning systems to add summer cooling and dehumidifying and convert the system for a year-around service.

By packaged air conditioning, is meant unit for the contractor which has all refrigeration connections, internal wiring, piping or refrigerant and the like-factory built and tested. However, in air conditioning, conditions are never the same. Two identical packaged air conditioning units may be installed in a square office or a long, lean dress store providing entirely different problems in installation and provision for getting rid of heat. And that is why any reliable heating and ventilating contractor can turn his peculiar ability and ingenuity into profit in many jobs.

Although Westinghouse is doing everything to make it easy for small contractors to apply air conditioning to ordinary homes and shops, the large heating and ventilating engineering organization remains the backbone for big custom-built jobs. Where a small contractor uncovers a complicated application, Westinghouse expects to provide a direct tie-in with their regular engineering contractors to make available up-to-the minute engineering practice. Technically, heating and ventilating engineering organizations have made tremendous strides the past few years and are an increasing factor in providing the proper air conditioning answer for complicated air conditioning jobs.

Leonard Adopts New Plan for Distributor Conventions . .

Something new in the way of product and sales meetings—a series of streamlined, miniature conventions for its distributors—will be held in Detroit early in January by the Leonard Refrigerator Division of Nash-Kelvinator Corporation, it has just been announced by Ray Legg, general sales manager.

As complete in their coverage as the large and elaborate conventions which refrigerator and automobile companies have been accustomed to stage, the Leonard "miniature conventions," each of two days' duration, will start January 6, following one another in rapid succession, Mr. Legg said. The programs, built around the introduction of the new 1939 models, will be identical.

"It is our belief that the usual type of convention is often too big, too unwieldy, without sufficient man-to-man contact between distributing men and factory officials," explained Legg. "We believe the 'miniature' conventions we are planning will make these meetings far more intimate and worth while than if we had our distributor body in Detroit in one large group."

With but 18 to 20 distributors in a group, the Leonard conventions will be held at the Book-Cadillac Hotel in Detroit. Friday and Saturday, January 6 and 7, will be the dates of the first convention. The second convention will take place Monday and Tuesday, January 9 and 10; the third, Wednesday and Thursday. January 11 and 12; and the fourth, Friday and Saturday, January 13 and 14.

New 100-Watt Fluorescent Lamp for Industry . . .

Out of the laboratory which produced the 100-watt high efficiency bulb-type mercury lamp comes a new light source for general industrial lighting, a 100-watt fluorescent lamp. Developed by the General Electric Vapor Lamp Company to supplement its line of industrial lighting units such as the long-tube Cooper Hewitt lamp, the new lamp is a tubular light source, 4-ft. in effective length.

The lamp derives its terminology "fluorescent" from its utilization of a special high efficiency fluorescent material as the inside coating of the tube. Ultra violet radiations produced in the tube are converted by this coating to visible light by means of a high ratio energy transformation. The rated life of the fluorescent lamp will compare favorably with that of other industrial light sources.

Probably the most outstanding feature of these lamps, resulting from use of the phenomenon of fluorescence, is their high efficiency. Contrasting with the 100-watt bulb-type mercury lamp, for example, whose initial efficiency is 35 lumens per watt (more than twice that of incandescent lamps of the same wattage), the efficiency of the 100-watt fluorescent lamp is 50 lumens per watt.

L. G. Huggins, Westinghouse application engineer, explains the high points of Westinghouse's new one-ton "Unitaire" conditioner . . .

News About People—

Herbert E. Plishker will succeed J. F. O'Brien, who recently resigned, as advertising and sales promotion manager of the lamp division according to announcement just received from Westinghouse Electric & Mfg. Company. Mr. Plishker has

been a member of the Westinghouse Lamp Division advertising force for more than eleven years and has served as assistant advertising and sales promotion manager for six years.

* * *

Announcement has just been made by the Carrier Corporation, Syracuse, N. Y., of the appointment of J. A. Gazelle as zone manager for the southeastern district. Mr. Gazelle has been associated with the electrical appliance industry for the past eighteen years during which time his headquarters have been located in practically every key city of the United States. For the past five years he has made his home in Atlanta, Georgia. In his new capacity, Mr. Gazelle will make his headquarters in Atlanta. In addition to its full line of air conditioning equipment, the Carrier Corporation also manufactures unit type air conditioning and heating equipment for residential use and a complete line of commercial refrigeration equipment.

* * *

The Wolverine Tube Company, manufacturers of soldering lugs and splicing sleeves, recently announced the appointment of Ernest T. Loyd, manufacturers' representative of Atlanta, Georgia, as their representative in Florida, Georgia, North Carolina, South Carolina, Tennessee, and the cities of Tupelo and Columbus, Mississippi, and Bristol, Virginia.

* * *

Two changes were announced recently in the personnel of the Adequate Wiring Bureau committee, according to announcement by W. E. Sprakling, chairman of the National Adequate Wiring Bureau.

Harris E. Dexter, sales manager of the Central Hudson Gas & Electric Corp., and chairman of the sales committee of the Edison Electric Institute, was appointed to the executive committee to replace Merrill E. Skinner, who found it necessary to resign.

S. G. Hibben, director of applied lighting, Westinghouse Lamp Division, Westinghouse Electric & Mfg. Co., was appointed to the plan committee to replace J. F. O'Brien, who resigned from the same organization to accept a business connection in another field of endeavor.

* * *

John Herbert Knapp, vice president and assistant general manager of Norge Division, Borg-Warner Corporation, died suddenly at his home in Detroit on December 1. He had been in ill health for several months prior to his death. Mr. Knapp played an important part in the growth and development of the Norge organization during the past ten years. He first served the company as purchasing agent until 1931, when he was placed in charge of the sale of Norge refrigerators and made vice president and general sales manager of the company.

* * *

Lee Clark, advertising and sales promotion manager of Frigidaire Division of General Motors Sales Cor-

poration, was appointed chairman of the plan committee of The Modern Kitchen Bureau, effective January 1, 1939. Mr. Clark succeeds Roger Bolin, Westinghouse Electric and Manufacturing Company, who served as chairman of the plan committee during the past year.

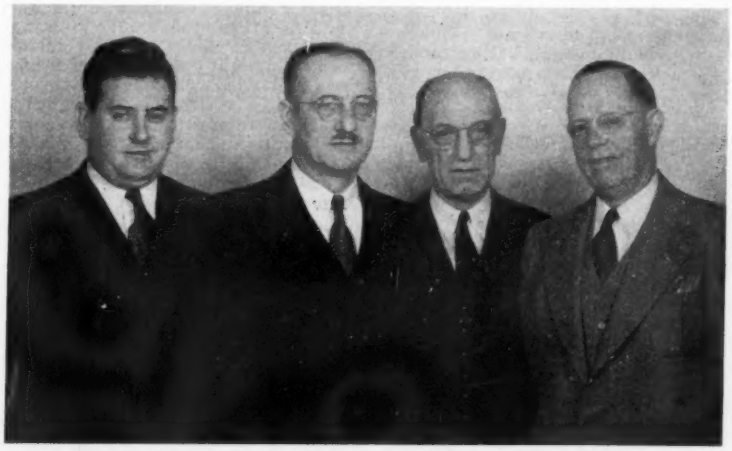
* * *

Electrical men everywhere will regret the passing of Sir Thomas Octavius Callender, one of the world's electrical pioneers, who died at the age of 83 on December 3 in Kent, England. Mr. Callender was founder of Callender's Cable and Construction Company and has many achievements to his credit. He strung the

wires for London's first electric street lights and laid cables in the Strand to electrify the Law Courts, the first big buildings to be lighted by electricity in London. The "Callender Solid System", a method of protecting street cables, was invented by him and used extensively ever since. He was considered one of England's greatest industrialists and was knighted in 1918.

* * *

George B. Richmond, formerly of Memphis Power & Light Company, recently resigned his position with that company to become chief of the attic ventilating department of the Hunter Fan & Ventilating Company, Memphis, Tenn.



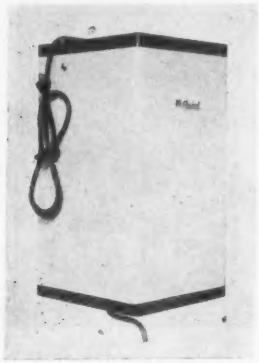
The Southeastern Electrical Manufacturers' Representatives' Club, of Atlanta, concluded its 1938 activities with a Christmas party at the Druid Hills Golf Club on December 28. More than two hundred members and guests were present.

One of the high points of the evening was the installation ceremony for new officers which included W. F. Watkins, president; C. C. Schoen, vice-president; and Paul Ramsey, secretary and treasurer. Shown above, from left to right, are Ernest T. Loyd, president for the past year, Mr. Ramsey, Mr. Schoen and Mr. Watkins.

Hotpoint Announces Two Gallon Water Heater . .

A two-gallon, non-pressure, automatic electric water heater which can be mounted right over the sink or wash stand is announced by the Edison General Electric Appliance Company, Inc., Chicago, Illinois, manufacturers of Hotpoint appliances.

Brackets welded at the top and bottom make the heater easy to



mount. No special connections are required. A six-foot rubber-covered cord at the back of the heater plugs into any ordinary 115-volt outlet.

Heating is accomplished by a 1150-watt Calrod unit immersed in the water. A dependable accurate thermostat at the rear may be adjusted to maintain a safe, even temperature.

Portable Electric Steam Radiator Offered . . .

A portable electric steam radiator for handy economical heating is now offered by the Burnham Boiler Corporation, Irvington, New York. These heaters are made in three sizes 115-volt, a-c supply, the size of the heating element varying from 750 watts to 150 watts. None of the heaters are more than 21 inches high. Each heater is filled with the proper amount of water and contains a non-freezing fluid.

Thermostat control is provided, the dial being marked in numbers from 1 to 5, giving a temperature range from 55 degrees to 80 degrees. Each unit is equipped with an automatic shut-off for electric current supply which operates whenever the pressure within the radiator reaches 5 pounds. The radiators are equipped with rollers so that they may be rolled anywhere and plugged in to a convenient outlet.

New Filterette Eliminates Shaver Interference . . .

Combining in a single unit the noise reducing efficiency demanded by radio listeners and the structural features necessary to meet electric wiring regulations, the new type R-1 Filterette just announced by the Tobe Deutschmann Corporation, Canton, Mass., effectively overcomes radio interference created by electric shaving devices.

The type R-1 Filterette is contained in a black bakelite housing 1-½" in diameter and 2-⅜" long. The unit is listed by Underwriters Laboratories.

Victor Mono-Matic Ironer

Victor Electric Products, Inc., Cincinnati, Ohio, announce their new Mono-Matic Ironer. The manufacturer claims this new ironer will handle a "full family wash", everything from sheets to shirts, as efficiently and effectively as larger ironers of similar design.

One of its main features is "portability." It is light in weight and can be used on any kitchen or bridge table and stored in a closet when not in use. Also, this feature is a great aid to selling as it permits a salesman to carry an actual demonstrating sample when doing house-to-house work.

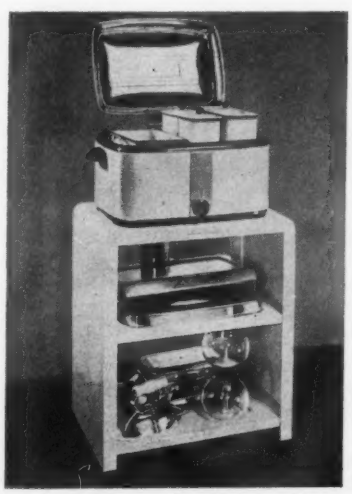
Another feature is "easy operation", and it has been shown that practically any woman, although totally untrained in using an ironing machine, can produce perfect work immediately without an expert demonstrator's assistance. Among other features are the 20 in. roll, single lever control for hand and knee operation and pressing, exclusive roll-lag action, pressure adjustment, more economical operating cost and an extremely low price.

New General Electric Roaster

Greater total capacity and a newly-designed broiler-griddle attachment which greatly expands the unit's services are the two principal features of the new automatic roaster announced by the appliance and merchandise department of the General Electric Company, Bridgeport, Conn.

The cream-baked-enamel finish roaster is complete with lifting rack, baking rack, and three covered vegetable pans and roasting pan in a choice of aluminum or vitreous enamel. The roasting pan has been constructed to the proper height to allow for the desirable browning of roasts and fowl. The complete range of cooking temperatures, from 150 to 550 degrees, is accurately controlled by an automatic thermostat, and the "on" and "off" switch with signal light adds to the user's convenience. The heavy-gauge wire lifting rack has been designed with ingenious handles which, when the rack is raised, automatically adjust it to rest on the upper edge of the cooking well, making use of the roasting and vegetable pans more convenient.

A convenient roaster stand, in similar finish, is also available. It is of steel construction with all joints and seams welded, and provides a convenient permanent location for the roaster, with ample space on one shelf for the broiler-griddle accessories, and room on another for small appliances. The stand is 27 inches high.



Ivanhoe Lighting Fixtures For Fluorescent Lamps . .

The Ivanhoe line of fluorescent lighting fixtures is described in a new booklet just published by the Miller Company, Meriden, Connecticut.

In addition to much general information on the new fluorescent Mazda lamps, this catalog contains complete information on both single and double tube reflectors of the concentrating type and single and double tube reflectors of the flood type. Accessory equipment for use with fluorescent fixtures such as pendant hangers, outlet box cover aligners, etc., is also described.

Benjamin Lighting Units Utilize "Daylight" Fluorescent Lamps .

A new line of lighting units designed to utilize the unique lighting characteristics of the recently introduced "Daylight" white fluorescent lamps and which provide heretofore unobtainable efficiency for lighting operations requiring accurate color discrimination, has just been placed on the market by the Benjamin Electric Mfg. Company, Des Plaines, Illinois.

Known as "Daylight" Fluorescent Lamp Diffusers, these new units have numerous industrial and commercial applications. A minimum of 100 foot-candles of daylight quality light can be uniformly distributed over an area 3 feet by 4 feet when a 36-inch lamp unit is suspended 30 to 36 inches above the surface; a proportionally lower intensity over a relatively smaller area is provided by the 18-inch lamp unit.

The reflector is of polished Alzak Aluminum with individual troughs provided for each of the three lamps. The reflector is covered by a gray porcelain enamel housing. Auxiliaries are built into these units and have ample leads for attaching to sockets in line leads.

SELECTIVE AIR CONDITIONS!

"SEE G-E!" That's the tip now spreading rapidly from lip to lip. For the new G-E Refrigerator of '39 is both a beauty and a bargain! Selective Air Conditions, perfected by G-E, give you a new, startlingly simple selling story that catches the interest and carries the quick conviction to your prospect that "G-E is the buy of your life!"

At General Electric Distributors' "Open House" in major cities from coast to coast, the new General Electric line is now being shown to thousands of serious dealers seriously intent on better business for '39. Be sure *you* "see G-E!"

Many fads and fancies in electric refrigerators come and go but you can continue to be confident that General Electric will be first with time-tested, true contributions that improve service and lower costs. From the "House of Magic" came the two developments most important to modern refrigeration sales and service—the first sealed mechanism and the first all-steel cabinet, both since widely copied. "Research Keeps General Electric Years Ahead"—and it is the policy of General Electric to always protect the public's purse and the dealer's profit.

GENERAL ELECTRIC

***Triple-Thrift* REFRIGERATORS**

GO G-E! —ALL THE WAY

A full line of electrical appliances that win public preference through performance. In practically every wired home in America there is a satisfied user of one or more products bearing the famous General Electric monogram.

A complete line of 15 models, including **THE NEW G-E THRIFTY SIX!**

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TOOLS

Time and Money-Savers for the CONTRACTOR

Hydraulic CONDUIT BENDERS
Knockout PUNCHES
Knockout CUTTERS
Cable PULLER
Joist BORER
Electricians' AUGER BITS
Bit EXTENSIONS
Hydraulic PIPE PUSHER

Do You Have a Copy of Catalog No. 31E?

Our new catalog, No. 31E, illustrates and describes all the tools listed above, as well as others of interest. If you do not have a copy, send for one now.

GREENLEE TOOL CO.
1707 Columbia Ave.
ROCKFORD ILLINOIS

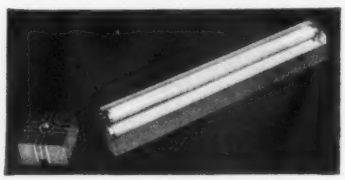
GREENLEE TOOL CO., 1707 Columbia Ave.
Rockford, Illinois
☐ Please send a copy of Catalog No. 31E.
Especially interested in .....
.....
Name .....
Street .....
City and State .....
My Jobber is ..... E.S. 1-39

Trough-Like Channels for Fluorescent Lamps . . .

The F. W. Wakefield Brass Company, Vermilion, Ohio, have just announced a line of fluorescent lighting equipment. This equipment consists of a trough-like channel provided with attractively designed end caps. The channel provides the necessary space for the housing of the auxiliary or transformer equipment so that two wire leads are all that have to be connected to the regular circuit.

Sections are made in various lengths to accommodate the 18", 24" and 36" lamps now on the market. Each section is made from heavy gauge steel finihsed in satin chromium. The reflector, which is shaped in the form of a double parabola to prevent redirecting the light back through the lamp, is supplied with a baked white enamel surface.

The unusual patented feature of the equipment is that it is capable of being interconnected in any number of patterns or combinations.



Shown here, in addition to the standard fluorescent unit, is a standard 90-degree connector which permits four of the units to be installed in an attractive cross and in many other patterns.

Bryant Fluorescent Lampholders

A new fluorescent lampholder is now offered by the Bryant Electric Company, Bridgeport, Connecticut, with the outstanding feature that it has been designed for either flush or surface mounting. The lampholders are of one piece construction, the body being of bakelite, designed to take both 1-inch and 1½-inch fluorescent lumiline lamps. Contact between lamp and lampholder is established by inserting ends in lampholders and twisting 90 degrees which causes the two pins in each end of the lamp to engage the bent portions of the terminals.

Other features of this lampholder is a bakelite cover plate which provides completely protected wiring on both surface and flush installations. Only one screw and nut is used for mounting, and ample wire channels are provided which take up to No. 14 wire.

Lower Prices Announced on Fluorescent Lamp Auxiliaries

Improved auxiliaries designed for fluorescent Mazda lamps and lower list prices were announced early in December by both the General Electric incandscent lamp department at Nela Park, Cleveland, and the Westinghouse Lamp Division, Westinghouse Electric & Mfg. Company, Bloomfield, N. J.

The new standard thermal switch-type auxiliaries are not only smaller in size in some models but are considerably lower in price. List price of "thermal" auxiliaries designed for 15-watt fluorescent lamps, formerly $2.65 each, is now $1.85; for 20-watt lamps, formerly $2.65 each, is now $1.85; and thermal auxiliaries for 30-watt lamps, formerly $3.30 each, is now $2.50 each.

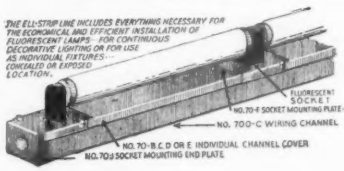
Fluorescent Wiring Channel

A complete line of Fluorescent Wiring Channel for handling all types of fluorescent lighting installations now supplements the regular line of Ell-Strip Channel made by Wilson Lighting, Inc., Chicago, Ill.

This equipment is suitable for general store lighting, industrial lighting over work benches, cove and dome lighting, luminous panels, display case lighting and many other purposes where the high efficiency and low operating temperature of the new lamps make them especially desirable.

The new channel is of the proper size for mounting the auxiliary reactance within the channel directly under each lamp, thus simplifying wiring and installation. Individual channel covers are provided with holes for attaching the reactance and are available in standard lengths for use with the 18", 24" and 36" lamps without any cutting or drilling, which insures accurate spacing between sockets so important with fluorescent lamps.

The patented lock-screw method of attaching the cover plates to the channel simplifies installation and insures a permanently secure assembly, yet permits instant access to the sockets, reactance, or wiring at any point without disturbing the rest of the channel. The channel covers


THE ELL-STRIP LINE INCLUDES EVERYTHING NECESSARY FOR THE ECONOMICAL AND EFFICIENT INSTALLATION OF FLUORESCENT LAMPS - FOR CONTINUOUS DECORATIVE LIGHTING OR FOR USE AS INDIVIDUAL FIXTURES - CONCEALED OR EXPOSED LOCATION.
FLUORESCENT SOCKET
NO. 70-F SOCKET MOUNTING PLATE
NO. 700-C WIRING CHANNEL
NO. 70-B, C, D OR E INDIVIDUAL CHANNEL COVER
NO. 70-J SOCKET MOUNTING END PLATE

are available in chromium plate, aluminum bronze, white enamel, and other types of finishes to match decorative arrangements and a line of reflectors for use with fluorescent lamps are also available.

New Catalog Available from Anderson Brass Works . .

A new catalog, No. 104-A, has just been announced by Anderson Brass Works, Inc., Birmingham, Alabama, manufacturers of a wide range of products for electrical distribution systems. The catalog is conveniently divided into sections which cover ground clamps, line clamps, lugs, tee connectors, miscellaneous connectors, studs, bus supports and cast aluminum terminal boxes.

New Bakelite Cover Devices For Outlet Boxes . . . .

A new line of Bakelite switches and duplex receptacles has been announced, assembled on Bakelite covers for outlet boxes. Switches are available in both single pole and three-way with a sturdy, dependable mechanism of the popular residential type. Bakelite covers come in two sizes for 3¼-inch and 4-inch boxes.

Devices are attractively designed for insulated system of urban work. Complete listings in catalog data sheet will be sent on request to The Arrow-Hart & Hegeman Elec. Co., Hartford, Conn.

"Deltaglass" Magnet Wire

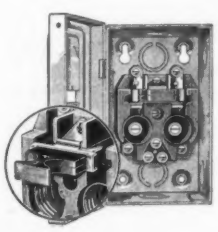
"Deltaglass" designates the new glass fiber insulation used for a new line of glass-insulated magnet wire recently announced by the General Electric construction materials division, Bridgeport, Conn. Like the G-E Deltabeston asbestos-insulated magnet wire, the new product is available in round, square, and rectangular shapes.

G-E Deltaglass magnet wire, recommended for apparatus windings where the temperature does not exceed 125 degrees Centigrade, is wound with a glass yarn to which Glyptal varnish, made especially for this purpose, is applied. Following this another layer of glass yarn is bound on. The Glyptal varnish permeates both layers, binding them together and to the copper conductor. The varnish also seals the glass and furnishes a smooth, uniform moisture-resistant surface.

The small diameter of the glass fibers used, and the flowing qualities of the varnish, make Deltaglass insulation thinner, thereby improving the space factor to a marked degree. This insulation is flexible, has high dielectric strength, and because of the special varnish resists abrasion.

New Safety Switch Line

Wadsworth Electric Mfg. Co., Inc., Covington, Ky., announces distinctly different designed front operated, safety switches, with and without bakelite dead front. A brand new



product, newly styled and designed is offered having these features: "Push-Pull" front operated; built to perform at the full 30 ampere capacity; "eye appeal" styled cabinet; exceptionally small, yet large enough to permit wiring without removing interior; interior mechanism, compact, accurately constructed and firmly installed in cabinet; gray composition base has separate terminals for each wire; front operated, "Finger Grip" sliding handle, made of durable, stamped ply-plastic, operates switching action.

A special safety feature provides that accidentally brushing against switching handle will not throw switch in "On" position.

Complete description will be furnished on request.

Plain Hoss Sense
+ good basic quality
+ up-to-date design
= SUPERIOR
REG. U. S. PAT. OFF.
★ ★ PRODUCTS
THE SUPERIOR SWITCHBOARD & DEVICES CO.
CANTON, OHIO
★ Manufacturing ★
METER & RELAY TEST SWITCHES
METER & TRANSFORMER ENCLOSURES
METER TEST BLOCKS & TABLES

Type M Raintight Multi-breakeR

Illustrated is the new Square D Type M Rain-tight Multi-breakeR. This device is intended for use in outdoor applications of service entrance and auxiliary services.

The box and cover are made of galvaneal steel with baked aluminum finish. Conduit hubs can be provided in top or bottom or both, in sizes to meet the usual requirements. Means are provided for sealing the deadfront trim which covers the wiring gutters and for locking the outer cover.

The view above shows a device containing one type M Multi-breakeR unit. However, this same construction is used on devices containing two or three type M units which make available in this line one to six single pole circuits, one to three double pole circuits or a combination

of single and double pole. Either grounded or insulated neutral can be furnished; in addition, the neutral can be omitted for range or water heater sub-feeds.

Greenlee Tools Catalog

A new tool catalog designated as No. 31-E has just been announced by the Greenlee Bros. & Co., of Rockford, Ill. This catalog, which contains selected items from the company's general catalog No. 31, was compiled to provide a more convenient reference for those not especially interested is the company's full line of tools. It contains complete information on the Greenlee line of tools for the electrical trade, as well as a few popular items used in other construction work and by carpenters and plumbers.

Westinghouse Combinaton Meters And Time Switches . . . . . .

A combination watthour meter and time switch for all applications where it is necessary to meter or control either two-rate or off-peak domestic loads has been announced by the Westinghouse Electric & Manufacturing Company. The elimination of separate time switch units make possible important economies in this class of metering and control.

The registers may be double-dial for two-rate applications or single-

dial for off-peak applications. In the double-dial registers, the time switch controls the drive to the register gear trains and operates the off-peak contracts when used. In the single-dial registers, the time switch operates and controls the off-peak contacts. The contacts may be single-pole, single-throw, or double-pole, single-throw, and are clearly visible for inspection through the side of the glass cover.

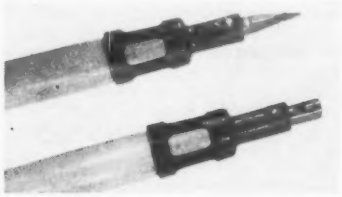
The time switch is synchronous-motor operated and is provided with a time-dial which is easily set for the two-rate and off-peak operations. The self-starting synchronous motor operates on the hysteresis principle and runs at a speed of 600 rpm on 60 cycles and is supplied for 230 volt service unless otherwise specified on the order. A sealable screw type plug in the front of the glass cover permits setting the switch time through an opening without removing the glass cover.

New Pike Poles Eliminate Carrying Hazard . . .

The elimination of hazardous projecting points is an outstanding feature of a line of new Safety Pike poles offered by the A. B. Chance Company, Utility Division, of Centralia, Mo.

This latest safety innovation is a pike pole with a removable point. The point is made in a separate piece, flat on one end and with a spiral point on the other. A spring catch on the side of the point holds it in place when slipped into the end of the ferrule on the pole.

The principle advantages of this new pike pole are that the point may be inserted in the ferrule, point first, for carrying on the truck thus eliminating the hazard of sharp projec-



tions; the gimlet or spiral point holds without slipping and it is only necessary to replace the point when it becomes badly worn. The means by which the ferrule is attached to the pole reduces materially the possibility of the pole splitting when under strain.

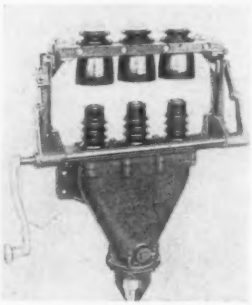
A. B. Chance Safety Pike poles are made of Douglas or Western Fir, free from all defects and lacquer finished. The ferrule is made of high grade malleable iron. Removable pike point is made of steel, heat treated. Ferrule and pike may be purchased separately.

Automatic Synchronizer

Allis - Chalmers Manufacturing Company, Switchgear Division, Milwaukee, Wisconsin, has come out with a new bulletin No. 1193 on their uniquely designed Syncro-Operator for automatically paralleling a-c generators, synchronous condensers, tie lines and frequency changers. The bulletin fully describes and illustrates this speedy automatic synchronizer which does away with the usual hazards of manual synchronizing in any type of generating plant. It includes a wiring diagram and goes into the many advantages inherent in this device.

G & W Device Converts Pothead Into Disconnect Mechanism . .

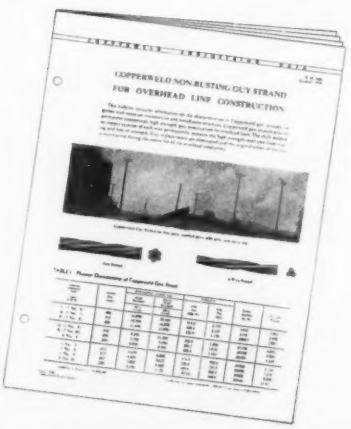
The attachment of a very simple gang-operating mechanism to G & W Type "ES" Disconnecting Potheads provides for quick and safe airbreak



disconnection of a cable at its terminal. The mechanism automatically locks past dead center when in the open position. The handle can be arranged for operating a pole top pothead from the ground. These potheads use the improved non-sticking plug and socket connectors. The device is manufactured by G&W Electric Specialty Company of Chicago, Ill.

New Strand Data Book Available

Copperweld Steel Company have just released an 8-page illustrated data booklet containing tabular information on the physical properties of guy strand, some notes on installation practices and a convenient graphical method of determining the



required strength of guys. Copies may be had on written request to the Copperweld Steel Company, Glassport, Pennsylvania. When you write, please ask for Publication E. D. 1686.

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The one-piece lug that cannot fall apart. Low in cost, high in strength and quickly installed with pliers or screwdriver . . .
Type KPA
made in 4 sizes for 30 conductor sizes
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APPROVED BY UNDERWRITERS
FREE a sample Scrulug on request; mention wire size
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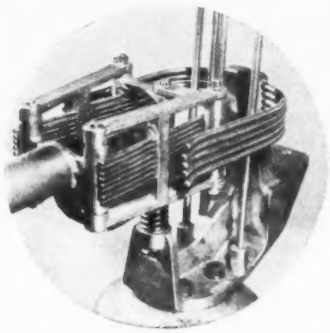
Gang Operated Disconnects

James R. Kearney Corp., St. Louis, Mo., announces a line of gang operated disconnect switches of the rotating insulator type in ratings of 7.5 KV through 115 KV.

Multi-point pressure, flexing contacts are actuated through a simple toggle mechanism, which provides sleet breaking action. Opening the



switch, the toggle is broken and simultaneously, the two jaws of the contact head are contracted. After this pressure is released the blade moves upward to a point where its center of gravity is about four inches past dead-center position.

Switches meet NEMA requirements. They are easy to open and close, due to the great mechanical advantage provided by the toggle. Ball bearings in the blade mechanism and under the rotated insulator further facilitate the easy operation of these switches.

Knox Porcelain Wireholder

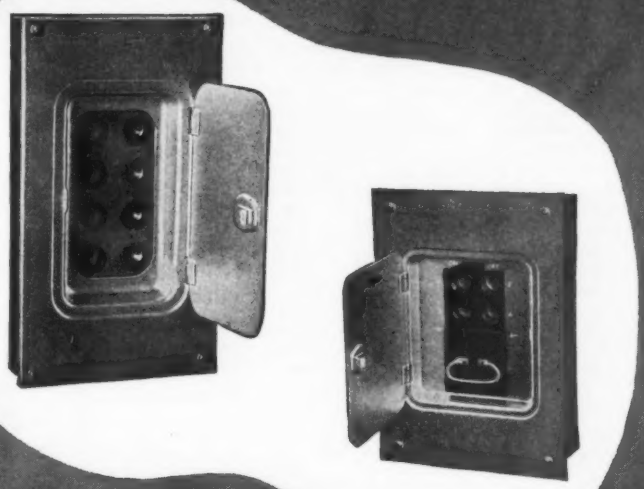
Shown below is the new shackle wireholder recently announced by the Knox Porcelain Corporation, Knoxville, Tennessee. One of the princi-

pal features of this wireholder is the fact that the porcelain part is in compression. Other features are heavy construction, strength and durability coupled with ultra-modernistic design.

New Relay for Street Lighting

A new low-priced photoelectric relay to control the operation of street lights has been announced by the General Electric Company. The new relay, employing the same principles as former relays to turn the lights on or off when nature's level of illumination drops below or rises above a level predetermined for safety, is available at a price less than half that of previous photo-electric relays designed to control street lighting. The new relay comes in a compact housing about one-eighth the size of former equipment and weighs but 10 pounds.

Build your Prestige with **PRESSED STEEL** *Fuse Panels*



Every contractor is judged by the job he does—*plus* the grade of equipment he uses. You'll get *more* jobs by using Walker panels. Their entire front is one tough piece of pressed steel, entirely eliminating the possibility of breaking of spot welds and "bellying" of dead fronts as in ordinary fuse panels.

Apartment Panels built for any number of circuits up to twelve. Resident type can include pull-out switches if specified.

Write for Full Information

WALKER
ELECTRICAL COMPANY
ATLANTA, GEORGIA

New Panel Instruments

The Westinghouse 37 line of panel instruments available as a complete line covering industrial and radio applications in a variety of forms has recently been announced by the Westinghouse Electric & Mfg. Co. The line provides for the measurement of direct current, Rectox types, thermocouple types and alternating current.

The entire line of instruments employs but two types of mechanisms. For direct current circuits and for rectox and thermal types the permanent magnet moving coil principle of operation is used. For the alternating current circuits, the repulsion iron vane principle of operation is used. They are rated at 750 volts which corresponds to a test of 2500 volts between terminals and the panel. Capacities as low as 20 microamperes are available in moving coil types. Self-contained ammeters of 50 amperes and voltmeters of 200 volts are available thus providing the economical maximum in variety of ratings with a minimum of external accessories.

Some of the distinguishing features of this line of instruments are longer scales, flush and projection rectangular forms, flush rectangular case forms available in vertical or horizontal arrangement of front plate, all forms of covers interchangeable with one standard line of mechanisms and bases.

Interest in Modern Kitchen Bureau Program Increases . .

(*Continued from page* 53)

utilities and manufacturers' representatives in the area. Among the utility companies with which he has recently worked are Georgia Power Company, Birmingham Electric Company, Alabama Power Company, Carolina Power & Light Company, Tampa Electric Company, Florida Power Corporation, Florida Power & Light Company, and Tenn. Electric Power Co.

Both Dr. Allison and Mr. Weadock report greater interest in the Bureau's program

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Fluorescent Lamps Provide New Lighting Tools . .

(*Continued from page* 12)

cause of the advantages of high efficiency, color quality, decorative value, etc., of fluorescent lamps, the applications will probably be largely limited to restricted areas for local lighting rather than for general illumination. The relatively high installation cost and the fact that each lamp requires a reactor will govern this to a large extent.

Although these lamps have been in development for several years, they are the first practical fluorescent lamps available. Having radically different characteristics, requiring entirely new reflecting equipment, housing, etc., these lamps offer great possibilities for improvements. Perhaps more efficient phosphors may be developed; auxiliaries may be improved; and less critical electrodes may be produced through further development. Production and greater demand will lower costs. These are only a few of the things which may create better fluorescent lamps and wider applications in the future.

The amazing results achieved for the low wattage expended have excited the interest of laymen as well as the entire electrical industry. If there should be some misgivings on the part of utility men as to the possible effect on revenues, such fears may be dismissed immediately upon consideration of facts regarding lighting, seeing and usage of light.

In the first place, history has shown that improvement in light output for the same or less wattage has resulted in greater use. The "science of seeing" has taught the public and the industry that we are still a long way from the ultimate goal in providing foot-candles for safe and comfortable seeing. Our paltry 40 or 50 foot-candle installations, of which lighting men are so proud, are still only a feeble star in the heavens of darkness under which we use our eyes. If we learn how to produce 100 or 100 foot-candles of illumination with low brightness, which is what we have in daylight in the shade of a tree, then will we begin to achieve seeing conditions satisfactory to the eyes. And the fluorescent lamp is a stepping stone which will enable us to make progress in that direction. It provides more light with low brightness, with less heat, and at lower cost.

Where poor lighting exists, it doesn't make much difference whether or not the lamps are turned on. If good lighting can be provided, it will not be turned off because its benefits, once experienced, will require its longer usage. The cost of light is already low, but it takes the advent of something like the fluorescent lamp to further lower costs to convince even elec-

St. Louis
requests the pleasure of your company at the
HOTEL
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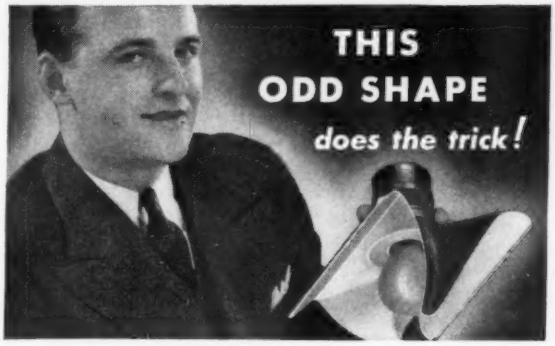
50% OF ALL ROOMS, $3.50 OR LESS, SINGLE
$5.00 OR LESS, DOUBLE



THE STOCKLITE
FOR LIGHTING SHELVES AND STOCK BINS

● If you have old-fashioned lighting in your stockroom, try the Stocklite and see the difference! It properly illuminates shelves from top to bottom as well as bin interiors. It eliminates aisle glare, provides comfortable vision, enabling clerks to fill orders faster, more accurately. Users everywhere are enthusiastic.

THIS BULLETIN gives you an illustrated story of modern stock bin illumination.

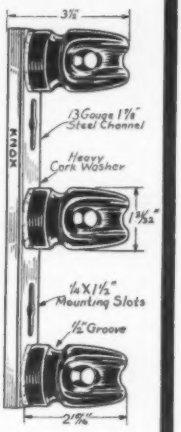
ASK FOR BULLETIN NO. 91

GOODRICH
ELECTRIC COMPANY
OFFICES IN ALL PRINCIPAL CITIES

GENERAL OFFICES AND FACTORY: 2920 N. OAKLEY AVE., CHICAGO, ILL.

KNOX
WIREHOLDERS and HOUSE BRACKETS

No. K-411 No. 5009



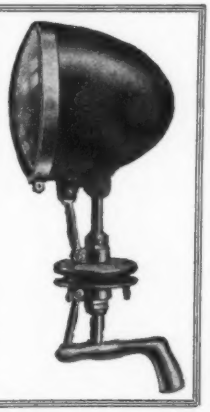
No. 1303

Thousands of contractors and power companies have chosen Knox wireholders and House Brackets because of their quality, strength and durability.

Sold through Electrical Distributors Everywhere.

KNOX PORCELAIN CORPORATION
KNOXVILLE, TENNESSEE

Master-Light Type "T"
Mounts On Repair Car Roof



"Just Point The Pistol Handle"

A Rugged Searchlight for Trucks and Repair Cars. Finished in black enamel and chromium plate. Switch in handle. 360°.

ONLY SPOTLIGHT MADE ESPECIALLY FOR PUBLIC UTILITIES

Write today for information regarding complete line of Carpenter Master-Lights.

CARPENTER MFG. CO.
179 Sidney St., Cambridge, Massachusetts

MAKERS OF WORLD'S ONLY COMPLETE LINE OF HIGH POWER HAND SEARCHLIGHTS

TORK CLOCKS
for
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Portable Models for Radios and Cookers

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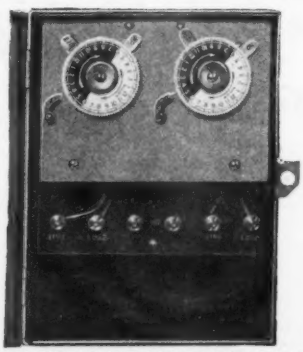

Don't Let Us Just **WISH** You A Prosperous New Year!

Let Us Help You **MAKE** It One with "AUTOMATIC" TIME SWITCHES INTERVAL TIMERS FLASHERS

Write for Information

AUTOMATIC ELECTRIC MFG. CO., Mankato, Minn.

EXTRA SALES FEATURES— the extra features of the Hamilton Beach food mixer give you extra selling points— easier sales.

NATIONALLY ADVERTISED in the Rotogravure Section of Sunday newspapers.

FREE DEALER HELPS— Complete — attractive. Furnished *free on request.*

Order Hamilton Beach food mixers from your Wholesaler. Write us for *free* dealer helps.

HAMILTON BEACH CO., Racine, Wis.
Division of Scovill Manufacturing Co.

HAMILTON BEACH FOOD MIXER

trical men that it is inexpensive. It emphasizes what a poor job we have done in selling the public on the low cost of light and electric service generally.

The fluorescent lamp is romantic. It is opening the door to a brighter and more cheerful atmosphere wherever light is used. It will mean that more light will be used. It will be used more hours of the day. Higher wattage and longer lamps are already in the offing, meaning an opportunity to increase the applications of fluorescent lighting. That won't mean the superceding of filament lamps by fluorescent lamps. For some time yet to come, the very low cost, simple, universal and altogether marvelous filament lamp will maintain its supremacy in the lighting world. Fluorescent lamps will supplement filament lamps, not supercede them. There will be many applications where both will be needed and used to advantage.

The fluorescent lamp is here, touched with romance of progress; a stepping stone that will help us produce lighting results that long have been a Utopian dream of lighting men. The contractor who fails to cash in on the profits afforded by these new lamps will painfully look back in the very near future and regret his lack of initiative and vision. If you're a contractor, don't let that happen to you!

What Do You Know About Motors? . .

(*Continued from page* 52)

used for winding mush coils for a-c machines in a complete pole-phase group without cutting the wire, thus eliminating stub connections.

(13) *False.* This refers to the short connection made between coils in series in a pole-phase group.

(14) *False.* A "star connection" derives its name from the type of schematic diagram used, which shows the three phases separated from each other by 120 degrees.

(15) *False.* The "chord factor" in a-c windings is the sine of one half the electrical angle spanned by the coil sides and indicates the reduction in effective turns.

(16) *True.* The term "wound straight up" means that the wires in the coil must be wound in an uniform and even manner.

(17) *False.* It is a multiplier used with a-c windings and depends upon the number of phases and the number of slots per pole, per phase.

(18) *False.* It is a coil that is wound around two pins on a flat mould, and is pulled open to obtain the proper shaped coil.

Systematic Modernization Of Mill Lighting . . .

(*Continued from page* 26)

consists of Standard RLM domes equipped with 300-watt white-bowl lamps mounted 12 feet from the floor and spaced 12 ft. x 12½ ft. apart. This system provides a uniform level of illumination of 15 foot-candles.

In Plant No. 1 at Fort Mill, S. C., a fine lighting job is produced by a system consisting of 384 Standard RLM domes spaced on 12 ft. x 12½ ft. centers, mounted 12 ft., 6 in., from the floor and equipped with 300-watt white bowl lamps. A level of illumination of 15 foot-candles is provided by this installation.

In the Kershaw, S. C., plant the weave room is lighted by 224 Glassteel Diffusers spaced 10 ft. x 12½ ft. apart mounted 12 ft. and 6 in. from the floor and equipped with 300-watt clear lamps, this installation also provides 15 foot-candles.

It is interesting to note that the area covered by the relighting program amounts to more than 30 acres of floor space. No lamps smaller than 300-watt are used in any of the cloth or weave rooms. In planning the lighting for the plants, the contractor gave consideration to easy maintenance. All units are equipped with disconnecting type fittings to permit easy and quick cleaning and relamping. Each unit also has shock-absorbing and cushion hangers to eliminate vibration. The lighting installations have been made by Harrison-Wright Company, of Charlotte, N. C.

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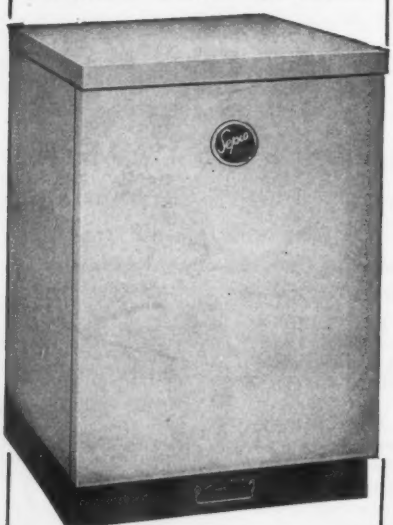

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